

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

THE AGRICULTURAL STUDENT

OHIO STATE UNIVERSITY, COLUMBUS, OHIO

LIBRARY
RECEIVED
MAR 10 1920
U. S. DEPARTMENT OF AGRICULTURE



FEBRUARY, 1920

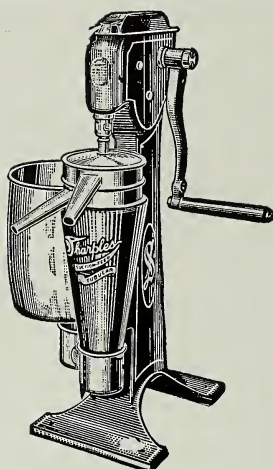
CONTRIBUTORS

WILLIAM F. BRUCE
JOHN BEGG
GILBERT BOEHM

GEORGE VALLEY
ARTHUR E. HALTERMAN
M. V. BRADY

KOFOID ALLEN

SHARPLES—the pioneer American Cream Separator and the only “suction-feed separator.”



“skims clean
at any speed”

The biggest step ever taken in the improvement of cream separators

was the invention of the *suction-feed* principle by SHARPLES. That stride forward put the SHARPLES so far ahead of the old fixed-feed separators—in ability to skim clean, elimination of discs in the bowl, and making possible a knee-low supply tank—that in the past few years SHARPLES Suction-feed Cream Separators have *replaced thousands of “fixed-feed” separators.*

“There are no substitutes for dairy foods.”

—P. M. SHARPLES



Today there are more SHARPLES Separators in use than any other make, American or foreign.

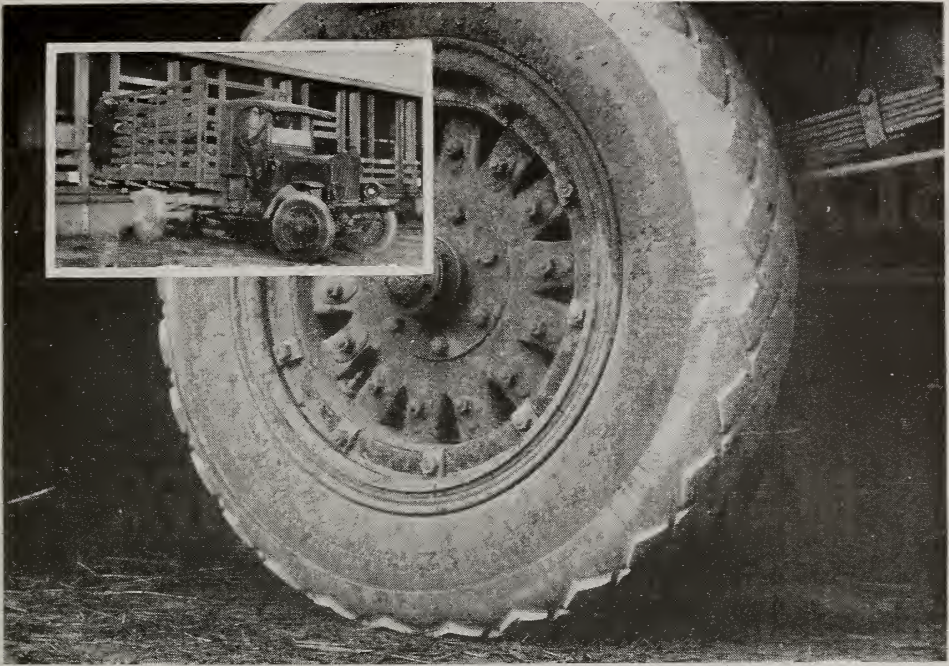
THE SHARPLES SEPARATOR CO.
West Chester, Pa.

Branches:

Chicago

Toronto

San Francisco



Copyright 1920, by The Goodyear Tire & Rubber Co., Akron, O.

"I was doubtful about a truck, but Goodyear Cord Pneumatics have made me an enthusiast. I haul hogs, sheep, cattle, coal, ice, hardware, groceries up to 200 miles a day — save time, labor, gasoline, oil and shrinkage. Farmers here know it pays to motorize and that pneumatics save roads."—F. L. Bixler, Rural Express, Fortville, Indiana

THIS story of saving time and increasing income by hauling on pneumatics is just one of a great number now coming from the rural communities of this country.

Farmers everywhere know that the tractive pneumatics enable them to haul crops right from where they grow, to save shrinkage and other deterioration, and to top their markets.

Farmers using trucks on Goodyear Cord Tires report that these agile tires offer the typical pneumatic advantages in utmost degree because they combine with these advantages a tremendous toughness.

Special information concerning the use of pneumatic-tired trucks on farms may be obtained from The Goodyear Tire & Rubber Company, at Akron, Ohio.



GOODYEAR

The New BLACK HAWK

MANURE SPREADER

Represents the last word in Manure Spreader Construction,
embodying these special features:

Short Wheelbase

Light Draft

Ease of Operation

Strength and Durability

If interested, full information can be had by calling on any
Oliver Dealer, or by Writing us:



Oliver Chilled Plow Works

General Offices, SOUTH BEND, INDIANA, U. S. A.

Works at South Bend, Ind.

Branch House at Columbus, O.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

HERCULES DYNAMITE

He Helps Make the Wheels Go 'Round

The retail dealer is a great factor in the development of a town and the farms which surround it. "He helps make the wheels go 'round.'"

The progressive dealer and the modern farmer work hand in hand to increase the wealth of the community and its individuals and thereby get better roads, better schools, better civic conditions generally.

The improvement of farm land is the first step toward the development of community and individual wealth. By clearing and draining unproductive land with dynamite the way is paved to increased crop production, a rise in land values, the greater use of tractors and other modern machinery and equipment.

In many sections of the country, Hercules Agricultural Service Men are demonstrating to farmers and dealers the use of Hercules dynamite on the farm. The farmer who desires further information can secure a 68 page booklet, "Progressive Cultivation", from his dealer or by writing to the Hercules Powder Co.

HERCULES POWDER CO.
1004 Orange Street
Wilmington, Delaware



*There are a few territories open
for additional Hercules dealers*



Hercules Dynamite is sold by Leading Dealers



WATCH THE CLETRAC

Make it a point to see a Cletrac in action somewhere.

Watch it turn the brown furrows—plowing faster—doing better work. Light-footed, but powerful, the Cletrac easily pulls a double disc and a seeder over the mellowed seed bed—never “digs in,” never “wallows”—doesn’t pack the soil.

Up hill and down, over wet, sticky ground or light, sandy soil, the small, compact, powerful Cletrac crawls sturdily on—riding on its own metal tracks.

Watch it in the hay field and the harvest field or running ditches, pulling stumps, sawing wood, filling silos—any *hard job* is a Cletrac job.

You’ll want to know why progressive farmers are choosing the Cletrac.

Write for the booklet “Selecting a Tractor”

The Cleveland Tractor Co.

Largest Producers of Tank-Type Tractors in the World

19123 Euclid Ave.,

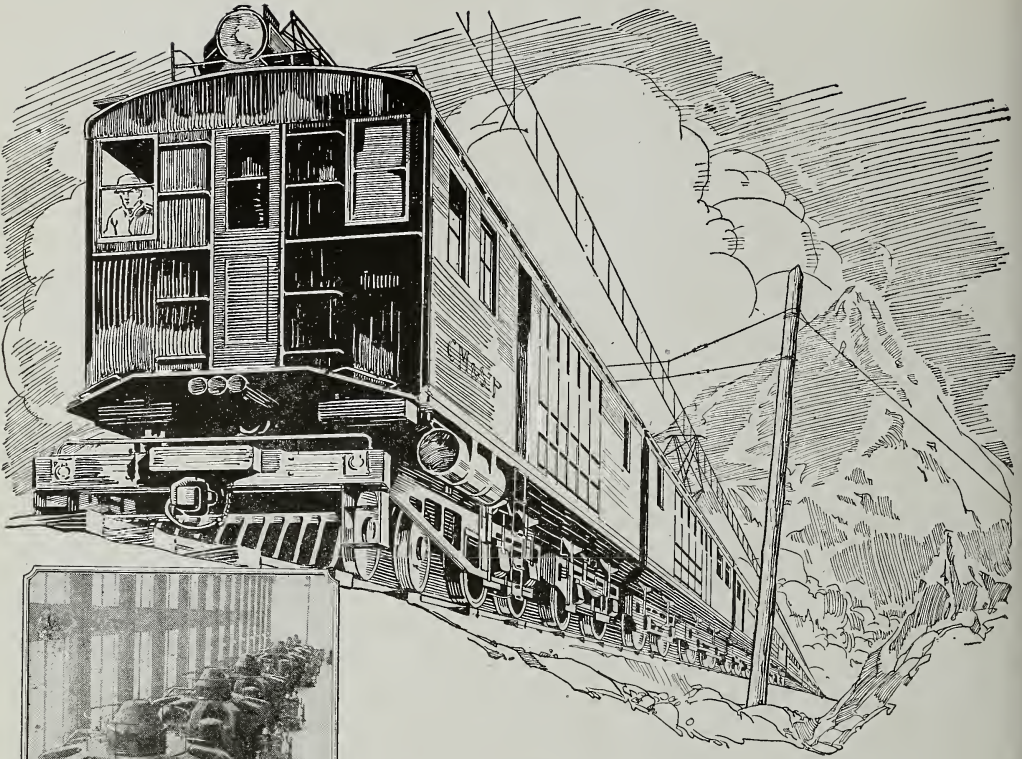
Cleveland, Ohio

TABLE OF CONTENTS



	PAGE
FIELD TRIPS FOR CLASSES IN VOCATIONAL AGRICULTURE—	
William F. Bruce	201
MARKETING FARM CROPS—	
John Begg	201
WHAT SHALL WE EAT?—	
Gilbert Boehm	208
RUSSIAN AGRICULTURAL ASPECTS—	
George Valley	210
A MODEL DAIRY FARM—	
Arthur E. Halterman.....	211
FARMERS' WEEK	212
THE OHIO STATE CORN AND GRAIN SHOW—	
M. V. Brady	218
THE TRACTOR TESTS	219
THE EASTERN STATES APPLE JUDGING CONTEST—	
Kofoid Allen	220
EDITORIAL	220
ALUMNI NOTES	224
HOME ECONOMICS	226





Generator room of one of the hydro-electric plants which supply power to the C. M. & St. P.

Some Advantages of Railroad Electrification

- Saving the Nation's coal.
- Lower maintenance costs.
- Greater reliability and fewer delays.
- Ability to haul smoothly heavier trains at higher speed.
- Operation of electric locomotives unaffected by extreme cold.
- Ability to brake trains on descending grades by returning power to the trolley

The Power of Electricity in Transportation

ELECTRICITY has leveled out the Continental Divide. The steam locomotive, marvelous as it is after a century of development, cannot meet all of the present demands for transportation facilities. Its electric rival has proved to be far superior.

On the mountain divisions of the Chicago, Milwaukee & St. Paul Railway—the world's greatest electrification—giant electric locomotives today lift an ever increasing freight tonnage over the mile-high Rockies and also make traveling clean and comfortable. They utilize the abundant energy of distant waterfalls and then, by returning some of this power to the trolley, safely brake the trains on descending grades. And their capabilities are not impaired by excessively cold weather when the steam engine is frozen and helpless.

Electricity is the power which drives the trains of New York City's subway and elevated systems. It operates the locks and tows the ships through the Panama Canal. It propels the Navy's latest super-dreadnaught, the *New Mexico*. Electric mine locomotives have replaced the slow-moving mule and the electric automobile has also come to do an important service. Such achievements were made possible by the extensive research and manufacturing activities of the General Electric Company.

Electricity has become the universal motive power. It has contributed efficiency and comfort to every form of transportation service and in this evolution General Electric apparatus has played a large part—from mighty electric locomotives to the tiny lamp for the automobile.

General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in
all large cities

Please mention THE AGRICULTURAL STUDENT when writing advertisers

DANCING SCHEDULE

MOYLES' ACADEMY

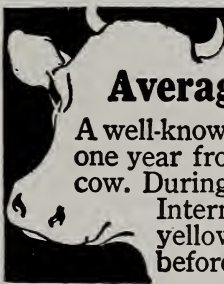
Keith's Theatre Bldg. (In the Heart of the City)
Bell, Main 3125—Citizens 5439



Private Lessons by appointment any day or evening. Wm. Moyles and his assistants make a specialty of private personal instruction.

Assembly Dances, K. of C. Hall, State and Sixth Sts., every Saturday night.

Take Oak Street car and get off at Sixth St.



Averaged 6,000 Lbs. Milk Per Cow
A well-known dairyman tells us his milk production for one year from 40 cows averaged 6,000 lbs. of milk per cow. During this period he fed a ration of three-fourths International Special DairyFeed and one-fourth yellow gluten. He states further that he has never before or since found any ration to equal

International Special Dairy Feed

As a Milk Maker

If you could come to our mills at Minneapolis and Memphis and see the care with which the ingredients are mixed — the thorough tests which are made — you would not wonder at the growing popularity of this famous ration. But above all, it has proved its worth in actual use, by increasing milk production and lowering feeding costs. And that is what interests you most.



Make us prove these statements. Ask your dealer for a trial ton. If he cannot supply you, write to us. You'll never regret this move.

INTERNATIONAL SUGAR FEED CO., Minneapolis, Minn.
Mills at Minneapolis and Memphis



The Agricultural Student

VOL. XXVI

OHIO STATE UNIVERSITY, COLUMBUS, OHIO, FEBRUARY, 1920

No. 5

FIELD TRIPS FOR CLASSES IN VOCATIONAL AGRICULTURE

By WILLIAM F. BRUCE.

(A new method of teaching agricultural subjects to high school students is discussed in the following article. Mr. Bruce tells about his method.)

COULD a course in field crops, animal husbandry, soils, farm engineering or farm management be given which would consist entirely of field trips? If such a course could be given, would not that be the very best way to teach vocational agriculture to high school boys? These questions were suggested to me by some of Dean Vivian's words in addressing the Smith-Hughes agricultural instructors on the subject, "The Teaching of Soils." We were told: "Do as much field work as possible. Stay in the school room only such time as is necessary." If you are an agricultural teacher, did you ever try doing "as much field work as possible?" If you are an agricultural student, were you ever in a class which failed to "stay in the school room such time as is necessary?" Are agricultural teachers overdoing or underdoing field trip instruction?

In the teaching of vocational agriculture under the Smith-Hughes law the object is to prepare the boy to make a success of farm life in that particular community. He must know the farm practices of that region intimately in order that he may follow those methods which are most successful and improve them wherever possible. The only way for the teacher and pupil to discuss these problems intelligently is for them to go out together into the

fields and feeding lots where they can see the same things at the same time. Hard farm problems must always be solved by the man on the ground and it is best to begin the solving of the easier problems in the same way. Have you not found that much time is wasted in school rooms in discussions in which neither the pupil nor the instructor understand each other?

We are training our boys to be farm managers. How much time does the successful farm manager spend in the field and how much at his desk? You will find him out in the open most of his time. So with our classes we may spend most of our time in outdoor studies, coming back to our office, the classroom, where we keep our accounts and record our observations. The classroom may well serve as a headquarters from whence we start on our trips and to which we return, bringing with us our samples from the grains and fruits and soils of the neighborhood. Perhaps, we stop in the office each morning long enough to read the market news and return in time to figure up our accounts and to examine more closely the specimens we have collected. We understand thoroughly that our work is out on the farms, but we recognize that our classroom office is an essential part of our farm equipment.

Although we may make up a course

of study consisting entirely of field trips, this does not necessarily mean that all the time each day is spent outside the classroom. Each field trip should be preceded by a period of preparation in which the class studies the problem for that trip in such a way as to make its solution on the trip possible. Then each farm visit may be well followed by a free discussion in which the lessons presented are made clear and definite. The period of preparation should be made short and to the

should always be in the process of preparing for definite field work, doing that field work or discussing their observations of a previous trip. This means that the actual field work will come very frequently. Just how much time should be spent in the preparation and the concluding discussion? Try this rule. Take a trip whenever the class can learn more of value out on the farms than in the classroom. How often this will be depends on the class and the teacher.



STUDENTS OF NEW VIENNA SMITH-HUGHES SCHOOL HUSKING OUT CORN—VARIETY TEST

point. Our preparation for trips is often general rather than specific, resulting in vague notions acquired by the class on the trip.

The class discussion following the trip should be reduced to as definite conclusions as is practicable. Calculations of profits attained by the methods observed gives the most decided conclusion. The class discussions should not be drawn out unduly, but keep them brisk and to the point as does the successful farm manager in making his decisions. It is better to go on another trip to decide a mooted point rather than continue a useless discussion.

According to this plan the class

Field trips demand more care and give greater educational results than any of the other methods of instruction. But if the teacher is careless in his preparation and management of trips, the class will easily waste more time than they ever can in any recitation or laboratory practice.

To make field trips a success requires close attention to the routine and the rest of the problem is to get the boys intensely interested in the objects of each trip.

In regard to the routine, the time of the class should be carefully planned to keep all the boys busy. Arrangements should be made so the class goes to and

from the farm visit in prompt and orderly fashion. All equipment used should be apportioned to the members of the class so that it is taken out and returned without loss or delay. Each trip is a problem in itself.

One of the chief reasons for using the field trip method of instruction is the natural interest which the boys take in all trips. It is the teacher's opportunity to develop from this first interest certain permanent interests in better crops and livestock. A graduate of the

be carefully selected in the first place. The agricultural instructor should be constantly on the watch for good field trip material.

The preparation for the trip should be in the form of a definite problem to be solved, so the curiosity of the boys may be aroused.

I believe it is a good plan in crops, livestock and building construction to make two or more visits to the same place so the growth and development



INSPECTING A TILE DRAIN

Ohio Agricultural College, who has become an exceptionally successful farmer and breeder of livestock, recently told me that a few farm management and livestock judging trips to some of the best Ohio farms, taken during his senior year, were more productive of inspiration to him than all the rest of his college course. These trips inspired him to accomplish results. The vocational courses must not only teach but they must also furnish the inspiration which leads to achievement.

Many factors may be introduced to make trips interesting. The trip should

may be observed. Anything which is growing is naturally interesting.

The handling of tools and instruments, especially of high grade instruments, adds to the interest the boys take in their field work. The class is especially interested in visits to projects of members of the class.

Emulation has always been used in schools to maintain interest, but not always with desirable results. It can be easily overdone. It is better to combine emulation with cooperation as in the forming of two or more evenly

matched livestock judging teams in the class.

All the methods of maintaining interest mentioned above would be classified by educators as spontaneous interests. It is sometimes necessary to use some methods which would be classified as forced interests. For example, our boys like to go on trips merely because the trip offers a relief in the school day. They understand that the number of trips we take depends upon the interest which they show on the trip and the evidence they give in discussion of having learned something worth while. Naturally they try to do their work in connection with field trips. This habit of paying attention to business when out on a trip soon develops to a high degree.

I have tried to suggest that in the

teaching of vocational agriculture we should make the field trip the basis of our work rather than an accessory. That in our study we should progress from trip to trip rather than from chapter to chapter. We must follow a seasonal sequence which might look illogical in book form, but which is the most natural and logical thing in the mind of the boy. We might take the field trip method as our ideal, progressing toward it as fast as is justified by the quality of the work done by our class in the field. The field trip method is such a radical departure from the classroom recitation that to be successful it must not be adopted too suddenly. The main point is that as teachers, we shall be going in the right direction.

MARKETING FARM CROPS

By JOHN BEGG.

(Mr. Begg is a farmer of Columbus Grove, Ohio, and Institute Lecturer. He discusses some of the old time methods of marketing and present day methods.)

MUCH has been said and written in recent years upon the above subject. It has become so important that practical and professional writers and public speakers choose it for one of their most interesting subjects. The State also a few years ago caught the spirit and through its Legislature established a bureau within the Department of Agriculture called the "Bureau of Markets," by which it hoped to bring greater economy in the marketing of farm products or at least facilitate the process of getting the products of the farm from the producer to the ultimate consumer.

Whether this department has accomplished what it started out to do, is not the purpose of this article. But, we feel justified in saying that an hon-

est effort has been made by those in charge of this work to make it of some real value to both producer and consumer. Enough has been accomplished to justify the experiment thus far and doubtless with added facilities for work and enlarge experience in the work much greater benefits will come to all concerned. One of the reasons for the increased interest taken in the marketing of farm crops is the enlarging of the markets for almost all kinds of farm products as compared with the markets which our forefathers had.

Every neighborhood contains many men and women who were active producers on the farms forty or fifty years ago when their only market for many of the surplus products was the local market at the nearest trading point.

This market consisted largely of a general store where the smaller products of the farm were exchanged for such household commodities as were needed in raising a family or keeping the home and farm supplied with such articles of equipment as were necessary under those primitive conditions.

In many instances very little money was needed or used in these business transactions. It was a common custom in those days for the housewife to take her surplus poultry and dairy products to such stores and in cases where the amount sold exceeded the amount purchased she was given a "due bill" instead of cash to balance the accounts. And these due bills became "legal tender" only at the particular store where they were issued. This method always insured the proprietor of these establishments the future patronage of the farmer at least until the amount of his personal legal tender was traded out.

It is very rarely that this form of currency is used in making settlements under present conditions. The large amount of money in circulation renders such practice unnecessary. Again our people are doing business more and more upon a cash basis as the years go by and as business expands.

Instead of the farmer now being dependent upon his local market as a place where he may dispose of his surplus, he is almost wholly independent of them. Especially is this true about such articles as butter, eggs, potatoes, poultry, etc., as were formerly disposed of at the country or village store as above stated. Now, speaking generally, very little butter is made on the farm as compared with that made years ago. Milk condenseries and similar milk plants have been built in many places to the great advantage of the farmer and the family. These milk plants have

not only been the direct means of expanding the dairy industry where they operate but they have proven a great boon to the farmer and his family. They have cheapened the cost of marketing the dairy product and at the same time have relieved the housewife of a lot of hard and unnecessary labor without in any way reducing the income from this department of farm production. Then the market was the country store for a hand-made product. Now they have the civilized world for a market, with an ever increasing demand for their dairy products at a minimum cost both in labor and money in producing them and getting them to market.

What is true of dairy products is in a measure true with all other farm products. But with these enlarged methods comes the necessity for many changes in methods which in some instances we know of the producers are slow to see or recognize. And one of the most important of these is that of preparing a product for the market so that it will attract the attention of the consumer. The slipshod methods in practice years ago in putting surplus products upon the market just as they happened to be without much regard to appearance or quality will not suffice now.

Many of the farmers' products are now being graded and sold upon their merits. This is as it should be and the sooner it becomes a universal practice the sooner will the pernicious practice of haphazard marketing become a thing of the past; and the painstaking, careful producer will get a just compensation for his honesty and careful industry in placing his goods upon the market in proper conditions. Besides, better feeling between the seller and the buyer will follow. The producer, by

giving his products greater care in their production and preparation, will himself know more of their real worth and value. Hence very much of that unjust suspicion as to the honesty of the dealer which exists too often in the minds of the producer would disappear.

Nothing will do so much to open the eyes of the producer as to the quality of his goods as will a visit to some of the big markets and see how his goods are graded there. It will also let him see what difference there is between a really good article and one of poorer quality at the selling place.

Another very important factor in which the producer is vitally interested in the marketing of farm products is that of good roads.

It has been said by some one that the old dirt road is the most costly kind of road that there is in this day and age. And while that seems like an exaggerated statement we believe it to be true. The facts are the old dirt road has outlived its usefulness. And even in localities where the making of roads are difficult there is necessity for improvement. And one of the hopeful signs of the times is that people everywhere are experiencing an awakening on this subject and are showing a willingness to be taxed to a reasonable degree for the proper improvement of the highways. In fact, it has become imperative on the part of the people to attend to this important public function. It is a part of our modern civilization and is necessary in the movement of our crops from the producer to the consumer. In localities where the sentiment is such that the improvement of our highways is retarded through fear of increased taxes, the producers are at a decided disadvantage when they have to place their goods upon the same general market in competition with

those who live where the public roads are improved.

Sometimes it costs the farmer more to get his produce to his local market over bad roads than it costs to ship them from the local shipping point to the final point of distribution hundreds of miles away. And yet we have a few people who are yet opposed to any road improvement. Their numbers are becoming less each day and it is only a matter of a few years until all of our highways will be improved so as to meet the demands of the age in which we live.

Improved roads also suggest and bring into action larger and better vehicles for transporting our produce from farm to market. Formerly these vehicles were limited to the common two-horse wagon for the larger crops and the common spring wagon for the less bulky products. Today both of these are rapidly being supplanted by the "tin Lizzie" and its trailer or a heavier truck that will transport all kinds of farm products.

So common are these new vehicles becoming that very little livestock is driven to market on foot as in former days. And as a matter of economy, both in time and the preventing of shrinkage in animals being marketed, these methods are a saving to the producer. Trucks are to be seen in almost all localities now hauling tons of milk and other produce to market, going to the farm and getting it. And in some localities buyers have trucks and go out to the farms and haul hogs, cattle and sheep to market instead of shipping them as formerly. And it is only a question of time until very little shipping of livestock will be done on trains within a distance of fifty or sixty miles.

A great deal of complaint is made about these trucks and autos damaging our public roads. That is true. But

they are here to stay and are a part of our modern civilization and cannot be dispensed with. The thing to do is to enact laws that will meet these conditions instead of decrying them. A good "road maintenance law" will serve this purpose as nothing else will. And until we have such a law well enforced we will never solve the local transportation problem satisfactorily. On the other hand, whenever our public highways are kept in as good repairs as our railways then we can haul larger loads at greater speed and thus reduce the cost of transporting our produce to the local market wherever that may be.

Another feature of marketing that will prove of value to producers wherever practical is that of cooperative buying and selling. We realize that it is a hard matter to get producers who have always acted independently of one another to cooperate. But with every other industry cooperating or acting together in their industrial affairs farmers will be compelled to do so in a greater measure than heretofore if they expect to get a "square deal" in business.

Cooperation has succeeded where given a fair trial and will succeed in a greater measure as producers become acquainted with the methods and learn its value.

Uniformity in production is another feature that can be adopted in the production of many articles on the farm with great profit to the producer. Where this has been tried the results especially in marketing crops and other products has been most satisfactory both to producer and buyer alike. In many cases it brings the market right up to the place of production. Buyers are always more willing to go to a locality where they know they can get what they want close at hand than they

are to go to places where the desired products are scarce and hard to find.

Farmers themselves do the same thing. How many times have we heard farmers say they went to the larger place to trade not so much because they expected to get things cheaper than in the smaller trading place but because they had a larger assortment to select from. This practice is followed in any line of business and when farmers begin to practice cooperation in community production they will realize the benefits that follow in cheaper marketing of their products. Not only that, but a decided improvement in all sorts of livestock and other products will take place wherever cooperative production is practiced.

Our College of Agriculture realizes the value of this method of production and has been and is now doing good work in teaching the farmers the value of such methods. Our farmers' institute instructors have also been very diligent in directing the farmers' attention to this method of cooperation in their lectures at these mid-winter meetings. Another factor which is contributing to the development of this idea among farmers is the "boys' and girls' club work." This club work among the young people on the farms will have more to do probably in changing public sentiment in favor of community cooperation than any other single agency. As a sample we might mention that while we are writing this article the people of this community are holding their annual "mid-winter fair." And one of the drawing features of this fair is the exhibit made by the Boys' and Girls' Calf Club. This exhibit consists of between 30 and 40 fine purebred Short-horn heifers brought there by the members of the club. No other feature of the fair is receiving the attention from

the visiting public that this exhibit receives. And no other exhibit is creating quite so much enthusiastic interest among the farmers. This fact alone will be a big boost for uniform breeding and production in this section in the future. No such show was ever given here and all others have been high class.

But cooperating in production is not the only good that will come from this work. These young people, both boys and girls, have taken great pride in fitting these calves for this show and also in preparing them for the public sale next April when these calves will come in competition with others in a public market.

These boys and girls have also been required to keep a correct account of their feeding operations this summer so that they can tell what the cost of producing this growth has been since they purchased these calves last spring. This is a vital matter in all forms of production and one which needs study and attention from producers if they would

know what the cost of their products are.

When a better knowledge of the cost of production is obtained by the producers and a system of real organized cooperation among producers established a better day will be in store for the farmers of the country in marketing their farm crops. And we may add in conclusion that when farmers know as nearly as it is possible what their products cost, the consumer will have a better understanding of what it costs to produce their food and clothing and will not be everlastingly harping about lower prices for farm products, thus curtailing the farmer's income and lowering *his wages* while with the same breath he clamors for an increase for his own labor. The consumer should be taught that no lasting industrial peace can ever be established in this or any other country where there is too great a gap between the prices paid for labor in the factory, or mercantile establishment, and on the farm.

WHAT SHALL WE EAT?

By GILBERT BOEHM, '20.

THE subject of food selection has always received a great deal of attention. The savage is primarily concerned with obtaining a sufficient amount to relieve his pangs of hunger. The guide of instinct is very good so long as there is an adequate supply of food; but the growing scarcity of the latter and ever increasing population have been presenting a problem of growing perplexity. Abnormally high prices are quite likely to lead to an unwise selection of food in disregard of the vital needs of the body.

Until quite recent years it was generally supposed that all foods were

pretty much alike; all that was necessary would be to have the proper amounts of protein, fat, carbohydrate and inorganic salts present, nature would take care of the rest. Results of recent investigations by European and American chemists have upset many of the former theories. They have shown when proteins are digested they are broken up into much simpler cleavage products, the amino-acids, most proteins yielding about eighteen different kinds. Corn protein, zein, is found to be lacking in two, lysine and tryptophane.

Hopkins, an Englishman, fed an ani-

mal a diet of purified fat, carbohydrate, and mineral salts, the protein being supplied in the form of zein. Animals fed this ration died. When tryptophane was supplied to the diet the animals lived, but growth was not normal until lysine was included. Gliadin, wheat protein, lacks one cleavage product, or amino-acid, which is necessary to the diet, and other examples

different proteins yield varying proportions of amino-acids. The muscles of several species of animals have been found to contain about 14 percent of glutaminic acid while the protein of wheat gluten yields about 40 percent of this cleavage product. This cannot be made over into any other, and it is evident that this excess cannot be used by the body. On the other hand there



OUR BEST FRIEND AND A REAL FACTOR, BUT RARELY SO CONSIDERED

could be cited of incomplete proteins. If zein or gliadin is the only one contained in a ration the animal will fail in its nutrition no matter how much protein be present or how satisfactory be the other constituents. So far as is known the animal does not have the power to make one of these amino-acids out of another except in one or two cases. It is necessary therefore that the complete list be available ready made.

Equally important is the fact that

are proteins that have amino-acids either lacking or present in too small amounts to be of any use to the body as a source of body nitrogen.

Dr. E. V. McCollum of Johns Hopkins University gives the following figures relative to the efficiency of proteins for growth in the young animal:

Milk protein	62.5
Oats	26.5
Wheat	16.0

(Continued on page 228)

RUSSIAN AGRICULTURAL ASPECTS

By GEORGE VALLEY.

THE proverbial primitiveness of the Russian peasant, his crude methods of husbandry, his lack of incentive and his general backwardness have been discussed time and again and dismissed with a sad sight of hopelessness. The fact remains, however, that approximately one hundred and forty-four million people of the former Russian empire belong to this class and continue to exist in just such primitive ways, because they were forced fifty years ago into a system which bred and perpetuated all these things.

When in 1861, by the "Grace" of the absolute power, the serfs were liberated, each peasant was deprived of part of his land, which he had enjoyed before the liberation. Officially this act was known as the "detachment." The amount of land "detached" varied in different localities, in some provinces it ran as high as 44 percent of the peasants' former holdings. This detachment forced the peasants to rent the land, usually from the former master. Too poor to pay the rent in cash, he paid it in "Kind" (Russian *barщина*) i. e. in labor as during the serfdom. In addition to the "detachments" the system of "redemption" was organized by the Government. The State assumed the duty of paying for the lands alienated in favor of the peasants. The peasants in return were to pay the state in several installments. The peasant not only paid for the land, but for his liberated "soul" also. (In Russia the serfs were called "souls.") This sounds mostly like ancient history, but it is worthy to recall that the redemption payments ceased only November 3, 1905. More than \$695,000.00 was paid into the State Treasury instead of the

nominal \$461,000,000. Hence during those fifty years the peasant was under this burden, which destroyed his economic independence, consumed all his earnings, leaving no surplus for the improvements. Working under the communal system of land ownership the individual peasant had to follow the obligatory rotation decided by the community as a whole. This system of communal property annihilated individual energy. The economic activity was kept at the lowest level by a network of minutest regulations of all kinds and ended in extreme subdivision of the land. In certain parts of the former Russian empire where the land system differed materially from the one just described, and where individual ownership was introduced, the situation of the peasant was far more satisfactory. This applies particularly to the Baltic provinces, Finland, and Cossack lands.

The ownership of the land by the nobility was another phase of the agrarian problem in Russia. The liberation of serfs did not bring about the actual breaking up of the feudal properties, but as mentioned before the peasant labor was resorted to for their cultivation. In 1861 the debt on the real estate of the nobility was \$170,000,000. With the liberation of the serfs, the nobles were also freed from this debt. The sum was added to the "redemption" payments of the peasants. Regardless of this, the nobility could not adapt itself to the new system. Beginning with 1861, the nobles lost about 1,620,000 acres annually to the peasants; 1890 to 1900 more than 2,160,000 acres were lost annually. This in spite of the fact

Continued on page 232)

A MODEL DAIRY FARM

By ARTHUR E. HALTERMAN, '20.

(The story of a farmer who has made a success and has not robbed his farm of its fertility, and his method of farm management.)

IF you will travel with me to a point midway between Columbus and Delaware, about one mile west of Stop No. 40 on the "Columbus, Delaware and Marion" traction line, you will find on the west bank of the Olentangy River and surrounded by alfalfa fields and blue grass pastures the home and place of business of one of the foremost and most successful dairy farmers of Central Ohio.

The Smith Brothers have been in the purebred Jersey business on this farm for about 15 years and the merit of their work and intelligence is in evidence in their herd of high quality cows, the business like methods, and the atmosphere of success which we find present. They are specialized farmers, their chief source of income being from the sale of whole milk shipped daily by truck to the University Dairy on the Campus.

Their milk is produced under the most sanitary methods as well as economically as possible. Cement floors and drains, cement manure pit, a track and car for hauling the manure from the barn, and individual water containers for the cows make up some of the conveniences of the barn. Sawdust can be obtained at a low figure near at hand and he considers this the best and cheapest form of bedding. The barns are modern in every respect but also modest as to outlay of money, which is so often overlooked in building a dairy barn. The Hyman Milking Machine draws the milk from the herd of 45 producing cows. Mr. Smith says he saves money on labor by substituting machinery, which is illustrated by the fact that he has six gasoline engines on the

farm, used for a variety of purposes from milking to grinding feed and pumping water.

A feed cutter is an important part of the equipment, for with it Mr. Smith manufactures a feed from one part ear corn and two parts alfalfa hay, worth \$60.00 per ton he says, which takes the place of a large part of the concentrates he would otherwise have to buy. He is also an ardent supporter of corn silage for feeding dairy cows and fills his two silos each year, then cuts his stover in the middle of the winter and wets it down, making it all into silage before feeding it. A special kind of ensilage corn is raised which, because of its heavy foliage, gives a much greater production from a smaller area. This year a ten-acre field filled one 125-ton silo and made a good start on a second one. The quality of the silage is greatly improved by the practice of drilling soy beans in the corn rows and then cutting it with a harvester which carries the soy beans into the silo, thus adding nitrogen as well as succulence to the corn stalks. Thus the farm produces the most of the dairy feed; however, 25 tons of mill feed of various kinds is purchased every year.

They have at the present time about 70 head of purebred registered Jerseys in all, including young stock and heifers and bulls. Six head of horses are still kept, making up one light and two heavy teams which are used during the busy season, but since a tractor was purchased five years ago it has taken the place of the horses to some degree, being used for hauling manure, grinding feed and preparing the soil for planting.

The brothers made a venture in sheep some years ago as a side line, buying ten old ewes at four dollars a head as a start. The wool the first year repaid the purchase price. They then bought ten more at fifteen dollars a head, and from this start they have a good sized farm flock which has returned \$400.00 in the last two years. They expect to go into the purebred registered Shropshire business in the near future.

They keep only a few hogs, having but one sow and a small bunch of shotes at the present time.

The farm itself covers 267 acres, all of which is rather rolling upland except 30 acres of bottom land which has been in alfalfa for five or six years. It takes about 100 acres of crops to furnish feed for their stock and the rest of the 267 acres are kept in a permanent blue grass pasture. A three-year rotation of corn, wheat and clover is followed on the upland, while the bottom land is farmed in corn whenever it becomes necessary to reseed it to alfalfa. They think the best method of seeding alfalfa is with a nurse crop of oats, cutting the oats off when green as hay. This is the only way they ever sow oats on the farm.

The alfalfa cuts five tons per acre on three cuttings and a fourth cutting could be made but is thought unprofitable.

This year 43 acres of wheat produced 30 bushels per acre after applying 300 pounds per acre of 16 percent

acid phosphate. The brothers follow the policy of applying most of their fertilizer to the wheat crop, but occasionally adding 200 to 300 pounds to the corn crop also.

Thirty acres of corn and about 20 acres of clover and timothy mixed hay brought the total up to near 100 acres in rotation this year.

A straw spreader will be used this winter for the first time to cover the wheat with straw and they are considering buying a two-row corn cultivator next summer. A new tool shed houses the machinery in good shape.

The land needs liming, and for this purpose \$700.00 was invested in a lime pulver which allows them to utilize the stone on their farm. Mr. Smith says, however, that the only thing gained by owning a pulver will be the convenience in a short haul for the product, since it will not be in use a very considerable length of time each year.

The manure is hauled on the pasture and any left over goes on the clover for the corn crop.

An application of 200 pounds acid phosphate was necessary on the pasture a few years ago to revive it and bring it into good production again.

The two brothers and two additional men do the work except in busy times when extra labor is hired. The two steady men are paid \$55.00 per month in addition to their coal, milk, and a garden, and they may keep chickens and

(Continued on page 236)

FARMERS' WEEK

THE Eighth Annual Farmers' Week is now history and it has been the biggest and most successful ever held. Figures show that 5,762 registered, while for last year the total number was

only 4,833. The first day's attendance was low because of bad roads and weather conditions, but by Wednesday all previous records had been broken.

Many organizations held conferences

and special programs during the week. There was much interest and enthusiasm shown during these meetings.

The first day started off promptly on scheduled time. H. C. Ramwoser told of Ohio's new drainage law, how it had been codified and simplified and the necessary procedure for a ditch petition to take.

The one big meeting on the Campus was that of the Ohio Farm Bureau Federation. In addressing the meeting Oscar Bradfute, of Xenia, president of the Federation, warned the farmers to be on their guard against any movement having for its end the enchantment of an amendment to the constitution providing for the classification of property for taxation.

"The only way to compete with industry in taking the labor from the farms is to match wages and to do that farmers must receive more profit from their crops," he declared.

"The city man must be educated so that he better knows the condition of the farmer, for too many erroneous notions have been formed already."

Mr. Bradfute outlined the following proposed program:

Correcting erroneous conception of city dwellers regarding agriculture, the profit from farming, the responsibility of the farmers for high prices.

Disseminate information regarding production costs, create sentiment among the consuming class favorable to a larger production on the part of labor; create a sentiment among the consuming class favorable to allowing farmers a wage commensurate with that allowed other classes of workers; gathering and disseminating information regarding supplies of farm products; proclaim that relief from the burden of high prices is to be found in

larger production of the individual rather than in higher wages.

O. M. Johnson, in addressing the Bureau on County Agent Accomplishments, said: "Develop an organization in your county that can practically take care of your difficulties. It is the duty of the County Agent to develop leadership, to help bring this about and not to try and visit each individual farmer, which is impossible. Just because the County Agent has not been on your farm is no reason why the movement should be condemned."

Rural residents are better acquainted with economic laws than city men, Dean Vivian stated in his address before the Farm Bureau. Belief that the organized American farmer, as expressed in the American Federation of Farm Bureaus, may prove to be the rational stabilizing force now so greatly needed in this country, was expressed by Dean Vivian.

"The war has left us a heritage of radical and fantastic notions, of strife and bitterness, which threatens to disrupt the nation," said Dean Vivian. "The farmer being farmer, capitalist, laborer and consumer in a small way can to a certain extent appreciate the views of all. The conditions under which he works and lives make him safe and sane since the country air is not conducive to the development of anarchy, radicalism, or bolshevism. The farmer, indeed, may prove to be the deciding factor, the balance wheel, so to speak, in the nation's welfare."

Dean Vivian added that he believed there is need of a farmers' organization, such as the American Federation of Farm Bureaus, to watch the legislative program of the states and the nation. He advocated such an organization, not so much for the sake of securing

legislation favorable to agriculture, he explained, as to guard against unwise and injurious legislation.

"The legislation for which the farmer has always stood," he continued, "is that which is favorable to the masses and against privileged classes, and he asks only for laws which are just to everybody.

"The farmer being better acquainted with economic laws than is the city laborer, knows that the limitation of productions is economically unsound, and that the only sound program is one in which everyone produces to capacity. 'A full day's pay for a full day's work' is the only safe slogan, and a living should be denied to all who fail to do a full day's work with hand or brain.

"I believe that the Federation of Farm Bureaus will avoid all unwise alliances; that it will be neither political nor sensational; that it will cater neither to capital nor to labor, but will always lend its influence to the right cause; that it will oppose all dangerous movements, and will prove to be a force for civic righteousness."

"To stop national extravagance is the duty of the farmer," so said S. L. Strivings, vice-president of the American Federation of Farm Bureaus. "You will never see living costs lower than they are now, for food is going to be higher in 1920," he continued. To prove this he quoted figures of the U. S. Department of Agriculture showing a 25 percent decrease in the amount of wheat sown in the fall of 1919.

J. R. Howard, of Clemons, Iowa, president of the American Farm Bureau Federation, suggested the extending of the cooperative principle all over the country so as to stop the widespread fluctuations of grain and livestock.

Mr. Howard told that it was the plan of the American Federation to extend the principle of cooperation to such an extent that small cooperative elevator companies over the United States should unite in broader and larger companies and they, in turn, in still larger ones, until the united strength of the farmers of the United States would enable the building of huge elevators at strategic shipping points to hold the surplus grain.

"Then," said Mr. Howard, "when the grain boards of trade conclude to bring on a slump, or when the market is otherwise depressed, there will be enough grain in those surpluses holding elevators to prevent cornering or price manipulation, and that will be a benefit not only to the owners of the grain, but also to the entire buying community, because the price will be stable and its fluctuations will be only those that are brought about legitimately by the operation of the law of supply and demand.

"It is quite useless to expect by legislation to prevent gambling in grain and provisions.

"We have two men in Canada this week studying the system of terminal elevators. Upon their findings we shall base our own plans."

Mr. Howard severely censured radicalism, rapped the Plumb plan, which, he said, if allowed to be worked out, would include nationalization of farms as well as of railroads, warned the farmers to be on their guard against adverse legislation, and said that the slogan should be "Stay on the farms" or soon it would have to be "Back to the farms."

The resolutions adopted by the Ohio Farm Bureau Federation follow:

Greater preparation of teachers in common schools; increased pay for

teachers, deplore the change in the Hughes health law by the adoption of the Griswold amendment; declare that relief from high prices may be found in increased production, decrease of non-productive methods and better distribution; recommend establishment of local cooperative mercantile enterprises; urge a road patrol system; declare the present system of real estate sales an economic waste; ask for forest conservation and prevention of forest fires; call for a system under which every laborer will be a stockholder in the factory in which he works; deplore the fabulous prices paid at auctions for breeding stock; regret differences that have arisen in connection with the administration of the experiment station at Wooster; invite all farmers and tenants to avail themselves of the services of the Federation, and indorse action of the State Federation in joining the American Federation.

Oscar Bradfute, Xenia, was elected president: H. P. Miller, Sunbury, was elected vice-president: H. C. Rogers, Mechanicsburg, recording secretary: and Harry Beale, Mt. Sterling, Treasurer.

Packers were scored for hoarding food in cold storage warehouses and farmers were defended from the charge of profiteering by Governor Cox in his address before the farmers.

"It is the result of the diabolical policy of packers in distorting the legitimate purpose of cold storage plants to destroy the law of supply and demand, that some city people believe that the farmer is a profiteer," said the governor.

A plea was voiced by the governor for more owners of farms and more home owners. "When there comes the question of the regime of the Bolshe-

vik, you can depend that the owner of the property will be the first to resist because he knows that the only protection for his property lies in the maintenance of government.

"But you can't encourage people to buy property if you put all the taxes on the property in sight," added the governor in advocating forcing intangible property to bear more of its share of taxation burdens. "If intangibles are taxed as they should be, it wouldn't be necessary to have a 10-mill levy, perhaps not more than a six, seven or eight-mill levy."

The time has come, Cox concluded, when it should be made known everywhere that we not only have tax limitations, but that the idea should be written into the constitution so that "no legislative caprice could take it away."

Mrs. Effie Arnold, of Dayton, told the farmers how she made \$2,000 from her chickens last year. How she was able to do this is very simple, she said. "The secret of success in raising poultry lies in doing the right thing in the right way at the right time," Miss Arnold told poultry fans. "Raising the chicks," she said, "is one of the most interesting features." Miss Arnold buys all her baby chicks, declaring it is as cheap to do so as to hatch them. Next summer she expects to rear 2,000 baby chicks.

Miss Arnold does not feed her chicks until they are 72 hours old. For the first feed they get dried bread crumbs, hard boiled egg and chick grit. Sour milk also is an article of their early diet.

As soon as the cockerels can be distinguished from the pullets the sexes are separated. When the males are ready for frying they are sent to market, full of special fattening food.

Miss Arnold said she saves money by mixing her own chicken food. All her eggs, after being carefully graded, are sent to New York. Her flock last year consisted of 532 hens.

"Eliminate everything that does not have to be done, organize your family to help in the work of the home, introduce labor-saving machinery whenever possible, throw yourself whole-heartedly into the cooperative farm movements and then you will have more time to give to the big problem of the farm community, especially the care of mental, physical and spiritual development of the children of the community."

This was the high spot in the talk which Mrs. Henrietta Calvin, a representative of the Bureau of Education in Washington, gave before the women visitors at Farmers' Week.

Mrs. Calvin related her experiences when left a widow with a farm as sole support for herself and five children, as an extension worker and as a director of the home economics work of the country from her office in Washington. She emphasized that the purpose of the home was to secure a safe place where children can be reared to be intelligent citizens and where grown people can come for nourishment, rest and recreation and thus be enabled to do something better for the world. "Sometimes," she said, "women lose sight of this farther motive in looking at the small problems at hand."

"There is no such thing as man's work and woman's work, especially on the farm," she declared. "Let every member of the family learn to help in the management of the home as well as in the management of the whole farm. Let the mother be a good executive; in other words, one who never does any-

thing that she can get someone else to do."

She informed the farm women that in spite of the fact that the whole outdoors is at the disposal of the farm child, he often suffers from lack of fresh air in his bedroom and in the living room; that he often suffers from malnutrition because the food is not cooked right or is not served in correct proportions. She pointed out that statistics proved that most of the teaching done in the rural schools of the country was child labor, because the farmers entrusted their children's education to teachers under 20 years of age. "Rural schools must be made better by more money and by better cooperation between communities."

High wages alone are insufficient to hold boys and girls on the farm, declared B. H. Darrow, Portage County "Y" Secretary.

If the tendency to quit the farm is not checked, he asserted, a serious situation is in store for farmers and city people.

"With 2,000,000 soldiers, who left the farm for the army, mustered out," he said, "there is less man power in the country than ever before. Desertion of the farm for the factory in northern Ohio counties is alarming. It points definitely to decreased production."

"There must be greater faith in the country-side, its future, its right to challenge young people to stay on the farm. Its lack of faith results in what might be called 'rheumatism of the community center.'"

H. W. Ingersoll, Cleveland attorney and milk producer, president of the State Dairymen's Association, characterized the needs, demands, and expect-

tations of milk producers in the meeting of the dairymen of the state.

"Milk," he said, "is the cheapest and best food known. The cow is not a member of the union, does not believe in strikes, and does not demand a six-hour day, five-day week and 60 percent increase in food.

"Most dairymen have no idea whether they are making or losing money. They should have a complete cost system and accounting and with reasonable profit added they will know what they are doing.

"They could then tell the customer what milk costs, and if the customer knew he would pay without grumbling.

"Dairy organizations should be armed with all facts to give the public. They should be so well organized they will get what is coming to them.

"We must establish a branch in each county, to be part of a strong organization, and that in turn to be part of a strong nation-wide organization."

"The purpose of agricultural education is to increase the supply, but at the same time it wants to be produced at a lower cost," was the keynote of Dr. H. C. Taylor, head of the Bureau of Farm Management at Washington, D. C., in his talk before the farmers.

"The remedy for farm prices is two-fold, first be sure you are producing the right thing and second be sure you are producing at a profit." Dr. Taylor urged the keeping of accounts, for without knowing the cost of production too many will continue to produce at a loss. He said price regulation cannot be fixed by Congress.

"There is no such thing as the cost of producing any one commodity. There are many costs. The average costs will not satisfy farmers, but the price must be high enough to take in

the production of the bulk of the commodity. Then the supply will be kept normal. This price will be known as the Bulk Line Cost."

Dr. Taylor stated, one of the major problems of the farmers was to get a continuous demand of labor through the whole year and to get crops that would give this demand.

"Better organization of the farm is needed to widen the margin of profit and make better farming and with better farming must go better living."

"Fish meal made from Mendaden is a good supplement with corn for feeding swine," declared W. L. Robison, of the Wooster Experiment Station. Results were shown to the farmers that some supplement high in protein is necessary for feeding swine. Among these was fish meal. It ranks as high as tankage in economy of production and is a good supplement.

The boys and girls were not left out in the program either. There were over 400 of them here at the expense of their county farm bureaus. They had talks, discussions, judging contests and were shown about the city.

In the boys' club sheep judging contest Clifford Frost, Hillsboro, won first prize; Dalton Swingle, Philo, second prize; and Harold Boltz, New Philadelphia, third prize.

Swine Judging Contest—Lawrence Edgerton, Edison, first; Thomas McLoughlin, Zanesville, second; and Ralph Bader, Trenton, third.

Horse Judging Contest—Walter Scheidt, Convoy, first; William R. Dodge, Marysville, second; and Wil-liard Engle, New Holland, third.

Cattle Judging Contest—Raymond Cooper, McConnelsville, first; Ted Kryder, McClure, second; and Robert Cooke, Dayton, third.

THE 1920 OHIO STATE CORN AND GRAIN SHOW

By M. V. BRADY, '20.

The 1920 Ohio State Corn and Grain Show was the most successful ever held, not only because of the greater number of entries, but also because of the industrial exhibits and the crowds in attendance. The entries totaled about 600, thus making keen competition in the various classes of which there were 60, thirty-two of these

Northwest Division — Frank W. Ruggles, Norwalk, Ohio.

West Central — O. J. Blamer, Johnstown, Ohio.

The grand champion single ear of the Ohio State Show was owned by J. W. Bland, of Bloomingburg, and the grand champion ten ears by O. J. Blamer, of Johnstown. This exhibit drew the National Stockman and Farmer Trophy cup.

In the Ten Acre Utility class for men



From left to right: O. J. Blamer, Grand Champion Ten Ears; C. L. Slack, State Winner 100 Bushel Club Contest; J. D. Woodburn, State Winner 10 Acre Utility Contest; Wm. Gilmore, Winner of Second Place in 10 Acre Utility.

being for corn and the rest small grains and sheaf exhibits.

C. E. Troyer of La Fontaine, Indiana, judged the show, his work being very acceptable both to entrants and to the officials of the Ohio Seed Improvement Association, who were in charge.

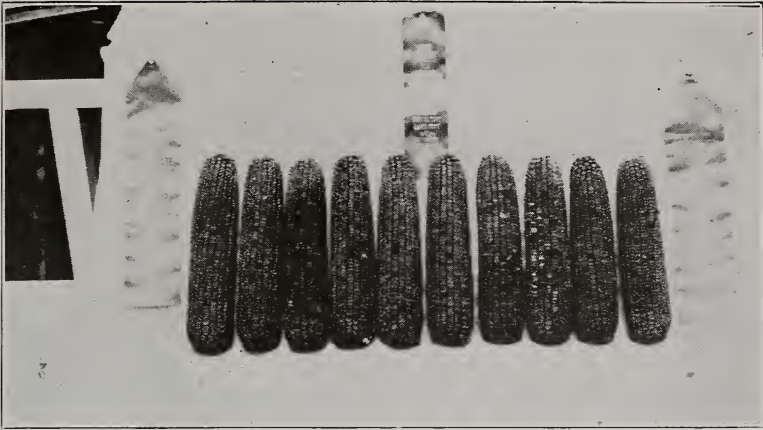
The state was divided into four divisions for purpose of competition; the divisions and sweepstakes winner in each division follows:

Southeast Division — Jay Lawrence, Coshocton, Ohio.

Northeast Division — M. L. Combs, Alger, Ohio.

who had competed in the 100-bushel club contest, the points were yield, cost of production, quality of corn and completeness of reports. This was won by J. D. Woodburn, of Urbana, the Ohio State Grain Dealers' Association Trophy Cup being first prize. Mr. Wm. Wilmore of Croton, was second.

During the last days of the show, gold medals were conferred on those who had been successful in the 100-bushel club contest, eleven men receiving this distinction. Mr. C. L. Slack, of Zanesville, won the State championship this fall with an average yield of 128.81 bushels per acre on ten acres. In a special class for ten ear exhibits from



GRAND CHAMPION TEN EARS GROWN BY O. J. BLAMER,
JOHNSTOWN.

the 100-bushel club men, Mr. L. A. Demorest won the blue ribbon.

Of the small grains, greater interest was aroused in the grand champion wheat, judged on its milling and baking qualities. This drew the Ohio Millers' State Association Trophy Cup and was won by R. B. Caldwell, of Cumberland.

In the County Farm Bureau contest, Coshocton county drew first place with

a score of $113\frac{1}{2}$ point, the nearest rival being Union county with $92\frac{1}{2}$ point to her credit.

It augurs well for the future of the Ohio corn crop that the ten ear exhibit of Paul Sheerin, winner in the Boys' and Girls' Corn Club contest was the *runner-up* for the grand champion ten ears of the 1920 Ohio State Corn and Grain Show.

THE TRACTOR TESTS

The one big feature of the program of the Department of Agricultural Engineering during Farmers' Week was the tractor tests. The tractor is commanding more and more attention from the farmer each year, and the one thing always remaining as a doubt in his mind is the question of power. It has been the aim of the Department of Agricultural Engineering to test the various tractors, so the farmer may know from comparison just how each tractor performs. During four demonstrations last summer the Department tested 28 tractors on the draw bar and during farmers' week they tested 31 at the belt.

The tractors were operated under the same conditions as far as possible. The Standard Oil company furnished the kerosene and gasoline and Mobiloil was used for lubrication throughout. The tractors were allowed to warm up and adjustments made and then each one was run for one hour on rated load test and then an hour on variable load test, and the governing mechanism, and finally an hour on maximum load. It was on the maximum load that one was able to draw conclusions regarding the conservatism of rating among manufacturers.

Below is presented the results of the test and shows the performance of the various tractors:

Name of Tractor	Rated		Maximum		Fuel Test		Lbs. fuel per H. P. Hr.	Cost of Fuel per H. P. Hr.	Fuel
	H. P.	R. P. M.	H. P.	R. P. M.	H. P.	R. P. M.			
1 Eagle	16-30	450	35.9	467	30.7	457	1.066	2.67c	Kero
2 Shelby	9-18	850	*	*	17.52	831	.972	4.06c	Gas
3 Cletrac	12-20	1265	23.51	1329	20.8	1314	.761	1.91c	Kero
4 Whitney	9-18	750	*	*	17.85	745	.855	3.59c	Gas
5 Twin City	12-20	1000	33.12	1066	20.0	1007	.872	2.19c	Kero
6 I. H. C.	8-16	1000	20.0	1003	16.2	994	.762	1.91c	Kero
7 Wallis	15-25	1 430	29.4	460	25.75	442	.583	2.44c	Gas
8 Happy Farmer	12-24	900	25.93	970	24.39	907	1.151	2.88c	Kero
9 Frick	15-30	900	*	*	31.1	903	.861	2.16c	Kero
10 Reliable	10-20	700	*	*	18.08	686	.988	2.48c	Kero
11 Huber	12-25	1000	26.12	990	24.15	988	.987	2.48c	Kero
12 Aultman-Taylor	15-30	900	38.7	989	30.55	916	.823	2.07c	Kero
13 Eagle	12-22	450	23.16	469	22.26	455	.984	2.47c	Kero
14 Steel Mule	15-22	900	28.5	966	22.66	882	.686	1.72c	Kero
15 Wallis	15-25	900	*	*	25.7	935	.917	2.30c	Kero
16 Frick	12-24	900	*	*	22.7	900	.740	1.86c	Kero
17 Fordson	10-20	1000	*	*	20.6	1031	.758	1.90c	Kero
18 Moline	8-18	1650	30.68	1750	18.7	1716	.792	3.31c	Gas
19 Case	10-18	1050	*	*	18.5	1085	.806	2.02c	Kero
20 Case	15-27	900	34.2	981	27.15	900	.682	1.71c	Kero
21 Titan	10-20	575	31.3	600	20.18	580	.935	2.35c	Kero
22 Rumley	12-20	560	28.1	575	20.1	563	.562	1.41c	Kero
23 Wellington	12-32	900	29.0	923	23.3	960	.740	1.86c	Kero
24 Case	22-40	850	51.6	930	40.8	866	.686	1.72c	Kero
25 E. B.	12-20	900	26.8	973	20.3	915	.766	1.92c	Kero
26 Rumley	16-30	530	39.1	575	30.5	543	.722	1.81c	Kero
27 Heider C.	12-20	850	25.35	967	20.0	854	1.157	2.91c	Kero
28 Heider D.	9-16	1000	22.8	1126	16.06	1014	.850	2.15c	Kero
29 All Work	15-30	800	*	*	23.3	830	1.056	2.65c	Kero
30 Russel	15-30	1000	*	*	30.18	1034	1.16	2.92c	Kero

* No maximum load. ! Pulley.

THE EASTERN STATES APPLE JUDGING CONTEST

By KOFOID ALLEN, '21.

THE Eastern States' Apple Judging League had its origin when, several years ago, West Virginia gave a large silver cup as a prize to any school which could produce a winning judging team. The school that should first succeed in winning the cup three years was to keep it. West Virginia, Maryland, Pennsylvania, Massachusetts, New Jersey, Ohio State, Iowa and Delaware had entered in previous years.

This year the League reorganized, as it had lapsed during the war. The contest was scheduled for January 9th at Rutgers College, New Brunswick, New Jersey. The schools that entered were New Jersey, Maryland, West Virginia, Pennsylvania and Ohio State. New Jersey had won twice, West Virginia once and Ohio State once. A win

for New Jersey meant the permanent possession of the cup for them.

Work started here at Ohio State about the first of October. About fifteen men were out for the team which consisted of three men. The work was in charge of Professor F. C. Charles of the Department of Horticulture, who was assisted by A. W. Barr, a senior in the department.

The team and alternate were selected before Christmas vacation and the men were back New Years ready for work. The team finally chosen consisted of R. Bretz, senior; A. P. French, junior; K. M. Allen, junior, and G. E. Fisher, junior, as alternate.

The team and coach left for New Jersey the evening of the 7th, arriving in New Brunswick at 2:30 the after-

noon of the 8th. They were met at the depot and after being assigned to rooms were taken out to the farm.

The Agricultural College buildings are on the Experiment Station grounds a mile and a half out of town. The buildings are new and well equipped. They have no Horticultural building as yet but have been granted money to build in the spring. Their Horticultural greenhouses are as extensive as, and compare favorably with those here at Ohio State.

Maryland, West Virginia and Ohio State teams spent an hour or two looking over fruit from other sections of the country. Pennsylvania did not arrive till evening. The men were all on good terms and each boasted of what they would do the next day. Later the teams were taken to the fraternity houses where they were to stay.

The Ohio State team was entertained most royally and from all reports the other teams received the same treatment. The Chi Phi bunch were hosts for Ohio State and were a fine bunch. The evening was spent in seeing the town and going to a show. The team retired early for a good night's rest.

The contest started at 9:30 the next morning. There were twenty varieties set out in plates, besides the substitutes. Perhaps a word as to how the contest was conducted would not be amiss. First, there were three plates of each variety. A plate contains five apples. The rules of the contest allow substitutions to be made in one or two plates of each variety. This is done by putting in an apple of some other variety that is off color or shape for that variety and so looks like those with which it is placed. The scoring of the plates was given in an article by Prof. Charles in the December issue so no space will be

used for that here. Some of the points that had to be watched were:

Substitutions, uniformity in size and color, i. e. of variety, color of variety, blemishes, condition, lack of stem, diseases, codling moth, and scale. Each of these have a certain bearing on the placings so it is no simple matter to do the work.

At one o'clock a recess was called and the men went out for lunch. After lunch the work was resumed by the contestants. The last man finished about five o'clock. The coaches of the various teams who were the judges of the contest then took the papers and went over the work.

It was eight-thirty before the results were determined. The final count showed Ohio State, first; New Jersey, second; Pennsylvania, third; West Virginia, fourth, and Maryland, fifth. Maryland was unfortunate coming last when in individual scores a Maryland man stood first. The contest was very close. A perfect score would have been 4000. The first five men were all within 100 points of each other and stood in the following order:

1. Maryland.
2. Ohio State.
3. New Jersey.
4. Ohio State.
5. Ohio State.

The two Ohio State men were tied for fourth place. The Maryland man won first place over Ohio State man by 15 points out of a possible 4000.

After the contest the team parted company, some going to New York, Buffalo and one to Baltimore. It was a fine trip and all enjoyed it to the fullest extent and the pleasure was more than doubled by being able to bring back the cup to Ohio State where we hope it will always remain.



OF
OHIO STATE UNIVERSITY

A Medium for Exchange of Ideas Between College and Farm

Published by the Students in the College of Agriculture.

Established 1893.

Subscription Price, One Dollar the Year.

Entered at the Postoffice at Columbus, Ohio, as Second Class Matter.

STAFF

Geo. F. Henning, Jr., '20-----Editor-in-Chief Business Manager—Geo. B. Arthur, '20.
Helen Conard, '20 ---Home Economics Editor Circulation Manager—Dann O. Taber, '20.
C. V. Kendall, '21-----Managing Editor

Associate Editors:

Associate Editor—H. E. Walton, '20

Alumni Editor—Geo. Timmons, '22.

Assistant Business Managers:

Korwin Knowles, '22;

Ralph A. Hinman, '23; A. M. Hedge, '21.

Departmental Editors:

Agr. Engineering—R. I. Mitchell, '20; O. R. Keyser, '21.

Animal Husbandry—E. F. Townshend, '22; C. F. Moses, '22.

Agr. Education—G. A. Dustman, '20; E. B. Barker, '21.

Entomology—Philip Lowry, '20.

Farm Crops—J. C. Neff, '20; H. L. Gartner, '21.

Dairying—A. N. Neu, '22.

Horticulture—Alvin Barr, '20; C. E. Gressle, '20.

Soils—Vance Clever, '21.

Rural Economics—P. B. Hess, '22.

NOW IS THE TIME TO TAKE YOUR INVENTORY

The goal is half won. One semester is gone. We can look back over our path as a reminiscence and see our mistakes for we all have made some. But what good have you gotten out of the past few months. Have the experiences and benefits come up to your expectations. It has been entirely up to us individually whether we have gotten anything worth while. If we haven't done what we think we should have done, right now in the beginning is the time to start in and do that which we should do the entire year. So let us think it over and decide once for all.

FARMERS' WEEK

Between semesters this year was held the eighth annual Farmers' Week. This is the time when the farmers of the state turned the chores over to the

hired man or some one else and journeyed to the University to get some new views and keep abreast with the time, for we are moving fast these days. It is the time to renew acquaintances with many of our old friends, meet new friends and observe what is taking place around us.

There was a different attitude noticed among the farmers than in previous years. He was more anxious to learn, listened more intently, was more business like and showed more pep. It has been said of the farmers several years ago that they were a hopeless task, but that is far from the truth. Now they are anxious to become acquainted with new things, new discoveries, new performances, and the new steps of advancement this world is taking. There was a time when the farmer paid little attention to the things going on about him, but now he is alive, he has pricked up his ears, we are going to hear from him more and more in the future.

And to many of the students of the Ag. College who went home between semesters the following sentences are directed. Little one realizes how much one misses by being away from lectures and discussions of the Farmers' Week. One has the opportunity of hearing the best in the country along their special lines. If they are really interested in Agriculture, those who left surely and certainly missed something worth while.

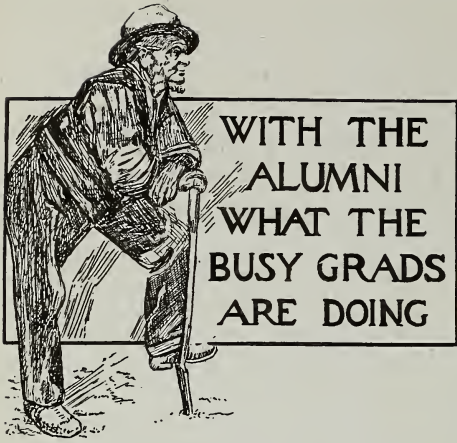
THE OHIO FARM BUREAU FEDERATION

When one sat in the meetings of the State Farm Bureau during the past Farmers' Week he couldn't help from being thrilled. The business-like procedure, the activity, the enthusiasm, the good wholesome thinking made a fellow feel proud that he was a farmer, and a student of Agriculture. Those meetings, talks, and discussions pointed conclusively to the fact that the one longed for hope of the Farmers has been realized, namely organization. The farmer has been knocked about from pillar to post, he has been made the goat, he has had to accept conditions without true representation, he has been misrepresented, but now that low smouldering fire has burst into flames. The farmer is alive. He soon will be organized as completely as Capital and Labor not for any unjust or selfish reason, but merely to stand for his rights, obtain justice, and meet the other fellow on an equal basis.

The Farm Bureau is the organ. It is not political, selfish, social or unjust, but is democratic, will bring justice to the farmer, and is organized for business. It is not like some farmers' organizations with an organizer at the head, usually for selfish means, but the movement started with the farmers and has grown and grown until a great National Federation has been formed. It started right and is going to be continued right and already its force has been felt nationally.

Now we, students, should aid, assist and get behind this great movement in our home counties, boom its membership, talk its activities, live and be a part in this great organization.

At last, that great, slumbering, mammoth force has been awakened. *The Organized Farmer.*



L. L. Rummell, Agr. '15 and M. Sc. '17, and his brother, W. W. Rummell, Agr. '16, have entered a partnership in livestock farming at The Maples, Medina, Ohio. They are making a specialty of breeding high-class Guernsey cattle and Duroc Jersey hogs. During his senior year at Ohio State, L. L. Rummell was editor of *THE AGRICULTURAL STUDENT*, a member of the dairy cattle judging team that won premier honors at Chicago, and a member of the University debating team. He became editor of publications at the Ohio Experiment Station soon after graduation and for the last two years has been associate editor of *The Ohio Farmer* at Cleveland. He will continue as a farm paper correspondent. W. W. Rummell served two years with the famous Fifth Regiment of Marines.

J. W. Henceroth, '13, who has been with the Soils Improvement Committee for the past five years has assumed the management of a 1600 acre farm for the J. T. Polk Canning Company at Mound City, Illinois. On this farm canning crops and general crops are raised. Pure bred and grade livestock is kept and consume the by products of the canning factory. While in school Henceroth was editor of *THE AG. STU-*

DENT, member of the Toastmasters' Club and was on both the Dairy and Livestock Judging Teams.

Carl R. Arnold, who has just completed his agricultural course this semester has taken a position with the Rural Economics Department as Farm Management Demonstrator.

J. A. Howenstein, '19, is secretary and Wendell P. Miller, '19, is treasurer and general manager of the Agricultural Engineering Company of Columbus, a company organized to give agricultural engineering service to the farmer.

O. E. Barker who finished his work in school at the end of the first semester, will begin teaching agriculture immediately at West Alexandria.

Fred A. Schulz, ex. '19, is managing a grocery at Piqua, Ohio.

Reed L. Kennedy, ex. '19, is farming near Berkey, Ohio.

Hugh G. Selby, ex. '19, is connected with the Templer Motor Car Company of Cleveland.

Stanley W. Leonard, '16, is in Landscape Architect work at Reading, Pa.

Harry C. Patterson, '16, has a position as chemist with the National Cash Register company of Dayton.

Robert R. Barker, '16, has charge of the Madison and Miami County Experiment Farm.

William H. Lapp, '16, is poultry extension specialist at Ames, Iowa.

Charles C. Ensign, '14, is farming near Bryan, Ohio.

George F. Crane, '12, has a position as secretary in the extension service, O. S. U.

Myron D. Miller, '14, formerly county agent of Defiance county, has resigned his position and gone into real estate business at Bowling Green, Ohio.

James R. Royan, '12, is teaching at Houston, Ohio.

Fred H. Herzer, '14, is managing one of the branch plants of the John Wilde company in Wisconsin.

Ralph A. Routsong, '15, is county agent of Montgomery county.

Herbert M. Barnes, ex. '15, is farming near Paulding.

William C. Joest, ex. '19, has a position as district representative of the Peoples Efficiency Publishing company and is located at Madison, Wisconsin.

Sanford G. Price, '19, is farming and managing a creamery at Woodville, Ohio.

Marion V. Bailey, '18, a former business manager of THE AGRICULTURAL STUDENT, is now county agent of Hocking county.

Chauncey R. Lang, '18, is teaching in a Smith-Hughes school at Brookville, Ohio.

Herbert E. Marshall, '17, is farming at Beaver Dam, Ohio.

Dana G. Coe, '17, is in chemical research work in connection with nitrogen fixation work at American University, Washington, D. C.

William H. Gowdy, '17, is in the farming business at Xenia, Ohio.

Arthur T. Edinger, '18, is in the butchering business with his father at Chillicothe, Ohio.

Harry W. Palmer, '16, is conducting a feed and seed business at Greenville, Ohio.

Delmer C. Jobe, '18, has a large bunch of Hereford feeders that he is finishing for spring market. He also is raising some sheep and farming with his father at Cedarville, Ohio.

Ernest N. Fergus, '16, is teaching chemistry at the University of Indiana.

Carl C. Lowe, '17, is county agent of Sandusky county.

Arthur S. Clark, '18, is working with the Akron Pure Milk company.

Allen L. Baker, '17, is farming at Cincinnati, Ohio.

Clarence O. Sibenthaler, '14, is connected with the Sibenthaler Nurseries, Dayton, Ohio.

Lott E. Bechtel, '16, has a position with the John Wilde company of New York.

Robert E. Billman, '17, is farming with his father near Dayton.

Wallace L. Hammond, '17, has sold his farm at St. Clairsville and is contemplating going into business.

John W. Stratton, '17, has a position with a bank at Piketon, Ohio.

Walter D. Feller, '17, is farming at Mt. Blanchard, Ohio.

Floyd V. Lortz, ex. '17, has a position with the Oliver Chilled Plow Works of Columbus.

Ralph D. Seif, '17, is farming at Galion, Ohio.

Melvin E. Wyant, '18, is assistant State Nursery Inspector and is located at Painesville, Ohio.

John E. Schaffner, '17, supervises work in different plants over the country for the John Mellins Food company of New York.

Ralph Richardson, '18, is in Smith-Hughes work and is located at St. Clairsville, Ohio.

Harley J. Bower, '12, has a position as Agronomist at Manhattan, Kansas.

Floyd W. Bell, '12, is a professor in Animal Husbandry Department at College Station, Texas.

Francis C. Marshall, '13, is farming near Bluffton. He is specializing on hogs and cattle.

Douglas E. Pickens, '15, has a position as public accountant with Ernest and Ernest company at Birmingham, Alabama.

Thomas A. Rouse, '13, is instructor in Animal Husbandry at Clemson, South Carolina.

Home Economics Department

OLD FURNITURE

At a recent sale of antiques in New York, an early American Highboy was sold for nine hundred dollars, the same buyer paying \$1,025 for a sofa designed by the famous maker Duncan Phyfe. Same American farmhouses in the older parts of the country still display old furniture that would arouse the envy of a collector. Recently in the attic of a farmhouse in central Ohio a beautiful four-poster with most graceful lines was seen, having been discarded for a newer bed of brass which was hideous with ornamentation. Everywhere we find that much has been sold by persons who preferred new things and did not realize the value of the old. It is not to be thought, however, that all old furniture is of value but mahogany and rosewood pieces are usually well made by conscientious workmen and gain such beauty of color with the passage of time that their value is fairly well fixed even when considerably later than the Colonial period. The really old pieces are difficult to acquire but very good productions are in market at the present time.

In Columbus, an interior decorator is remodeling a very old house on East Broad street, which was about to be torn down. The idea to be carried out is, distinctly Colonial, both for exterior finish and interior decoration. Every room including the kitchen has its fireplace. The furniture is all old furniture and the rugs are the old New England hooked and braided variety. The house is to have an air of informal hospitality, typical of a Colonial home.

So much old furniture has the grain

of the wood so hidden by filler and paint as to conceal their real beauty. An old bed was resurrected from an attic, had the rope bottom replaced by springs, was scraped and polished until you could recognize the fact that it was cherry. When finished in soft dull red it was beautiful. It was used in a room with a cherry chest of drawers and Colonial Windsor chairs in ivory. The rugs were home-made braided rugs on a dark polished floor.

If one realizes the value of the good pieces of old furniture stored away in attics, perhaps the making of a new home need not be so expensive after all.

In connection with the teacher training work at Ohio State, the three practice schools are doing some interesting things and the sixteen students in training are getting into their practice teaching in a way which is bound to bring good results.

At the practice school at North High, where the student-teachers deal with pupils under city conditions, the pupils have been doing some nice things with their director, Miss Gromme, in planning and preparing real meals to which they invite some of their home folks as guests. The pupils have done the actual marketing and have taken the responsibility for everything connected with serving the meals.

Canal Winchester--The Vocational Home Economics work was to have been started in September, 1919. The school was chosen to be a practice center for teachers in training and the equipment therefore was planned to

demonstrate what would fit the needs of any vocational school. Kitchen tables and cupboard, apron lockers and sewing tables were made by a local carpenter. The equipment for the work at Canal Winchester is even better than had been hoped and now that it is fully installed, it is a splendid example of what any ordinary village high school could do with one large room and moderate means to make the Vocational Home Economics course possible. At their school fair, held last month, the Vocational girls had a splendid exhibit and took great pleasure in acting as hostesses in their new home. People of the community were surprised and delighted at the transformation which had taken place in the dingy old high school building. The practice teachers were there and took an active part in proceedings and had an excellent opportunity to gain experience in this sort of rural community work.

At Reynoldsburg, the pupils are getting good practical homemaking experience by managing and serving, with their small equipment, the teachers of the high school at noons. They served lunch to a football team and guests from a neighboring town a couple of weeks ago, and the teacher, Miss Waid, showed a fine spirit in the way she entered into the school plans for the day. Helping at such times as this gives the practice teachers valuable experience for the future.

Miss Hood, at the University of Cincinnati, has a promising group of seniors in her training class. After much difficulty, she and Miss Sauer, the able director in the Vocational Home Economics practice school at East High, have been able to bring together a class of seventeen girls who seem genuinely interested in their homemaking work

and take very kindly to the practice students who come down from the University. Their equipment is not yet in, but Miss Sauer is doing admirably to adapt their work to present conditions. The practice house for the training students is now in operation in a very satisfactory way, with Miss Hood as resident teacher.

Recently Miss Jane Addams of Hull House addressed a gathering in the Chapel at Ohio State University upon her experiences and work while on a tour of Europe's devastated territories under the auspices of the American Friends' Service Committee.

Everywhere, even in the United States and Great Britain, the question of housing is assuming monstrous proportions. In England it has been estimated that one million families are without homes of their own. At Hampstead Heath, the Garden City, a model village is in progress. It aims to show what can be done to cope with the housing problem. In this village, side by side, are large houses, small houses, single houses and double and complex houses. No class restrictions are made and all types of families are represented.

In France, in the devastated regions, families are returning to the sites of their former homes to fit together some kind of dwellings. The first to return in nearly all cases are the old women. There is a movement to erect new and more commodious dwellings on the original foundations. Loans are made to those wishing to build and so reconstruction is slowly progressing.

Of equal importance is the question of food supply. In most sections food is being distributed by food cards as during the war. The supply in most

KENNEDY'S CONFECTIONERY

Welcomes You

11th Ave., Entrance to Campus

places is totally inadequate. The children who are the coming generation present a terrifying aspect. Most of them are suffering from various diseases resulting from malnutrition. Their bones, lacking the proper mineral elements, are too weak to sustain even their frail bodies, bend under the strain giving them deformed bodies to carry on the work of the coming generation.

In conclusion, Miss Addams made a short plea for the housewives of America to carry on just a little of their war-time economy and conservation for the sake of those who were still suffering in war time conditions of want.

WHAT SHALL WE EAT?

(Continued from page 209)

Corn	24.0
Flax Seed meal	18.0

Mixture: Corn protein 3 parts, flax seed meal 1 part, 39.5.

The figures given are the units that are retained in the body for growth per 100 ingested. An efficient ration, then, would be one in which the excessive cleavage product in one food sub-

stance is largely used to compensate for a corresponding shortage in another. This is very clearly shown in the case of the corn and flax seed combination.

Milk proteins seem to possess the ideal proportions of these amino-acids in a ratio closely approximating that of the animal body, and are naturally adapted for supplementing the most commonly lacking factors in other articles of food. In one of Dr. McCollum's feeding experiments three lots of young rats were fed. All received a uniform ration of butterfat, salts, and dextrinized starch.

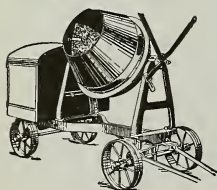
Lot 1 received wheat protein to the extent of 8 percent, which is of poor quality. These animals grew at only one-half the normal rate.

Lot 2 had 6 percent of the dextrinized starch removed and replaced by 6 percent of wheat gluten. This diet was still inadequate for normal growth and development.

The third lot received the same as the first but in addition 6 percent of milk casein. These rats grew as rapidly as they were capable. Both the second and third had the same amounts of protein, but the difference was between the particular kinds.

Aside from the question of relative values of proteins other very complex factors are involved in determining the nutritive properties of foods. In the course of time it has been discovered that there are at least two unidentified

(Continued on page 230)



Concrete Mixers

With or without Power. Built in many sizes. Send for Mixer Catalogue and Book on "How to Make Concrete."

The JAEGER MACHINE Co.

113 Dublin Ave., Columbus, Ohio.

TWO STORES Near the Campus

Selling Everything for Your Better Appearance in

MEN'S WEAR AND HATS

COLLEGE JEWELRY, PILLOWS and PENNANTS

The **MENSWEAR** Shop **ELEVENTH AND HIGH
SIXTEENTH AND HIGH**

YOU ARE INVITED TO
VISIT THE OLD RELIABLE

Baker Art Gallery

COLUMBUS, O.

STATE AND HIGH STREETS

For the Best Photos

The Largest, Finest and Best Equipped Gallery in America.
Special Rates to All O. S. U. Students.

CLUB PINS for Boys' & Girls' AGRICULTURAL CLUBS

B

BASCOM BROS.

1585 North High Street

COLUMBUS, OHIO

Doubly Welcome

you are when you come with a box of our toothsome candies. Every woman's heart melts at the sight of luscious sweets, such as we sell. Step in today and get a pound or two-pound package as a special gift for her. Select your own assortment if you like.

HENNICK'S

AT THE GATE OF THE CAMPUS

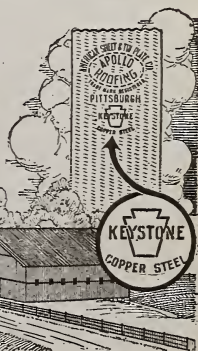


Apollo

Full weight—Galvanized—Roofing and Siding

Both farm and city property owners need to know the absolute safety and service of metal roofing.

APOLLO-KEYSTONE Galvanized insures durability and satisfaction for all forms of sheet metal work, including Culverts, Tanks, Flumes, Spouting, Garages, etc. Sold by leading metal merchants. KEYSTONE Copper Steel is also unequaled for Roofing Tin Plates. Look for the Keystone added below regular brands. Send for free "Better Buildings" booklet. AMERICAN SHEET AND TIN PLATE COMPANY, Frick Bldg., Pittsburgh, Pa.



Please mention THE AGRICULTURAL STUDENT when writing advertisers.

WHAT SHALL WE EAT?

(Continued from page 228)

substances whose chemical nature are not as yet well known, but whose pressence is indispensable in the diet. These have been called *vitamines*; Dr. McCollum, who has done a very great amount of work along this line, prefers to call the one *Fat Soluble A*, the second *Water Soluble B*. The presence of a third, *Water Soluble C*, has been suggested, but not as well defined as the first two. The last named is identified as occurring abundantly in fresh fruits, in roots and tubers, to less extent in milk, meat and green leaves. Its absence is said to produce scurvy. *Fat Soluble A* is present in abundance in milk fat, egg fat and certain animal tissues as the kidneys and liver. It is also found in reserve fat tissues of the body and in the cereal grains but in too small quantities to be of any value in nutrition. Leaves of certain plants as cabbage and alfalfa possess this dietary factor in considerably greater amounts than the grains. *Water Soluble B* is abundant in the **germ of cereals**, lacking in those grains such as polished rice, that have the germ removed.

Experiments of Dr. McCollum along these lines demonstrate that a ration of purified food stuffs which will not otherwise support life is perfectly adequate if 3 to 5 percent of butterfat and an alcoholic extract of 5 to 10 percent of wheat germ are added.

Additional deficiencies are encountered in the selection of the diet the importance of which has received more attention for a longer time. One of these is the deficiencies of certain mineral salts which is likely to exist. To discover the deficiencies of the wheat kernel the following experiment has been conducted:

Four lots of rats were fed; No. 1 re-

ceived wheat plus two purified additions—salts and casein.

No. 2 received wheat plus two purified additions—salts and butterfat.

No. 3 received wheat plus two purified additions—butterfat and casein.

The fourth lot received wheat and all three of the purified additions, salts, butterfat, and casein. All of these were able to grow to practically normal adult size and at a rate nearly normal, but the rats in lots 1, 2 and 3 were never able to produce young nor live much beyond one-third the usual length of life of well-nourished animals. The fourth lot receiving all three of the additions, salts, butterfat and casein, were perfectly nourished and were able to produce perfectly normal young which could repeat the process upon the same ration.

To one familiar with these things it is a simple matter to select a diet in which none of these dietary factors are lacking. It is possible to obtain one of purely vegetable origin which is quite adequate in every way. Such foods furnish our cheapest sources of body nourishment. But it is obvious that such a selection carries with it some risk in the hands of the average person who has no knowledge of these facts. It is much safer to include a liberal allowance of milk which supplies all the nutrients. A cereal diet is thus made safe which is likely to be especially deficient in the fat soluble *vitamine* and some of the protein cleavage products. Milk is one of the most economical sources of protein, in equal terms being about one-half as expensive as beef. Milk and eggs perform the same function as milk; their use in the diet should be purely a matter of individual preference, a question of the degree of economy to be exercised.

Prof. Rader's Dancing Calendar

NEIL AVENUE ACADEMY

Take Neil Ave. Car and get off at Poplar Ave.
647 Neil Ave.—Phones: Citz. 4431; M. 6189



Beginners' Class Friday evening, February 25, 7.30.

Afternoon Class Thursdays, 2:30.

Assembly Nights—Mon., Thur., Fri. and Sat.

Tuition for Beginners—Per term of 10 lessons, ladies \$5, gentlemen \$6; juveniles, per term of 12 lessons, \$5; private lessons, 5 for \$6.

Tuition can be paid \$1 a lesson until paid. Private lessons can be had afternoon or evening. We aim to teach you to dance in one term.

OAK STREET ACADEMY—827 Oak St.

Phones—Citz. 7105; Residence, Citz. 4431; Main 6189

A strictly private place for club dances, card parties and for classes that organize for special instruction.

WE DYE

and make-over Army Coats, Faded Suits, Dresses and Waists

Clothes last longer when thoroughly
cleaned by

LEHMAN, Dry Cleaner

12th Ave. and High St.

29 W. North St.

DELIVERY SERVICE

Garments Insured against loss by Fire or Theft

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

RUSSIAN AGRICULTURE

(Continued from page 210)

that the "Nobles' Land Bank" subsidized the nobles. The crisis was attributed to two factors: (a) the depression of the corn market, due to the American competition, and (b) the economic incapacity of the nobles. In Western Russia and in the Baltic provinces the nobility succeeded in keeping its wealth intact.

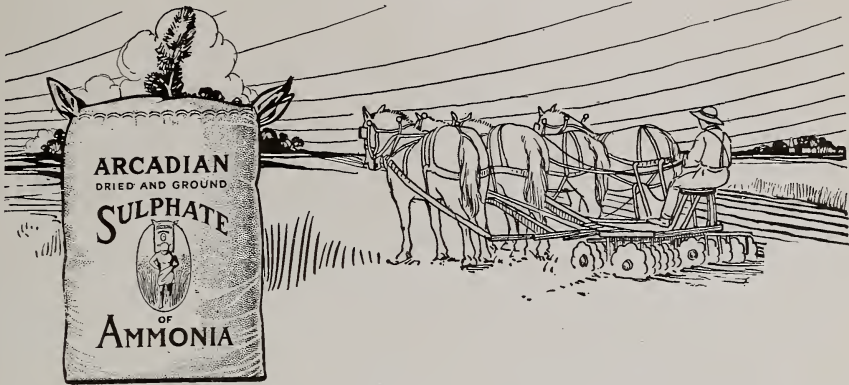
The increase of the population has been more rapid than the extension of peasant lands. In 1861 there were fifty million peasants, in 1897 eighty-five million, an increase of more than 70 percent. The land holdings decreased 37 percent—i. e. in 1861 each masculine "soul" was granted an average of 13 acres, in 1880 the average was 10.3 acres, in 1900, 8.1 acres. Hence the land famine was becoming more acute, and when the average of 8.1 acres for each peasant is compared with the 1552 acres as an average for every estate, the famine is even more glaring. Consequently, there always has been the feeling in Russia that the peasants' holdings should be increased at the expense of the State and of the nobility. It has been variously estimated that if every estate were allowed 135 acres and the remainder together with State, Crown and Church lands allotted to the peasants it would increase the smallest holding to the minimum of 44 acres, which would give the peasant five times the opportunity he had before.

This may seem a rather bold scheme of territorial aggrandizement in favor of the peasant, but Russia is weary of the agrarian disturbances and would welcome any scheme for the solution. All the reforms advocated have been steps in this direction, excepting the ones advocated by the czar's govern-

ment. The First Duma was dispersed because the Government could not accept the agrarian program advocated by the Duma. The Russian revolution of 1905 was mostly agrarian in villages, and when the revolution did come the first act of the Provisional Government was to confiscate the crown lands and open the land reserve of the State to the peasants. The solution of the local matters was trusted to the local organs of self-government. Meanwhile the Land Reform bill and the transitory measures for its practical enactment were prepared. This bill was never passed because of the dispersal of the Constituent Assembly. Only ten paragraphs were passed, and they abolished the right of ownership to land, made the land the property of the people, and transferred the control of the land to the central administrative organs and to the organs of local self-government. This, however, never became a law. The latest scheme attempted as a solution is the socialization of land—i. e. a plan on general Marxian principles, in order to create a landless proletariat class and eliminate the semblance of private ownership. The plan originated not because it had any special merit as a solution for the agrarian question, but as a part of the social experiments. Just how it will work out, time will show.

In conclusion it should be noted that the present deplorable condition of Russian agriculture is not entirely due to the back wash of the war, but to a much greater degree to the remains of semi-feudalism which was perpetuated in Russia up to recent years. The communal system undoubtedly aggravated the crisis and complicated the social and economic relations in the village. The short cut from semi-feudal-

(Continued on page 234)



TOP DRESSING TALKS, No. 4

THEORY OF TOP-DRESSING

Top-dressing refers to the application of a fertilizer to growing crops and includes "side application," "intercultural application" and "late application."

This practice of top-dressing growing crops with a quickly available nitrogenous fertilizer is one of the comparatively recent advances in the scientific use of plant food.

Potash and phosphoric acid become insoluble when added to the soil and must be applied before planting the crop in order that they may be mixed throughout the feeding area. If all of the nitrogen necessary for growth were to be added at this time, large amounts would be leached away before the plant could use it. By reinforcing the complete fertilizer by top-dressing the growing plant at just the right time, more nitrogen can be used profitably and better use may be made of the potash and phosphoric acid applied in the complete fertilizer.

ARCADIAN

Sulphate of Ammonia

Arcadian has been prepared to meet the growing demands for a high-grade nitrogenous top-dressing of good mechanical condition. Its non-leaching property assures highest yields.

Baltimore, Md.
Atlanta, Ga.

The *Barrett* Company

Medina, Ohio.
Berkeley, Cal.

AGRICULTURAL DEPARTMENT, NEW YORK.

RUSSIAN AGRICULTURE

(Continued from page 232)

ism to the utopian communism which is now attempted and applied as a solution, appears to be a rather long step. It has added to the complications. The peasants are still wearily looking for the solution of their sorest trouble, and are helping themselves to the land wherever they find it. This feature has removed the prospects of peaceful settlement still further. There is no party or power who will ever attempt to recover by force the lands which were unlawfully seized by the peasants. The only solution will be the plan with which the peasants will agree, this however will be accomplished by a long process of education. Until then Russia will always have her agrarian problem and agrarian disturbances.

Uri Bruning, '16, is farming at Bradner, Ohio.

ADDITIONAL ALUMNI NOTES

Charles A. Carran, '16, former champion Western Conference Tennis player, is now director of finance at East Cleveland.

Gus Smith, '15, is traveling in France and England in the interest of a rubber company of Elyria, Ohio.

Francis N. Pittinger, '14, has a position with a steel company of Warren, Ohio.

Gill Embry, '14, is farming at Hebron, Ohio.

Olin H. Smith, '14, is with a steel company of Cleveland.

Max M. Phillips, '16, is county agent of Huron county.

Herbert A. Wise, '14, has a position with a creamery at Indianapolis, Indiana.

Ernest M. March, '14, is running a fruit and general farm at Ashtabula, Ohio.

WHEN YOU THINK OF

FLOWERS

GIVE US A TRIAL.

WE FURNISH THEM FOR ANY OCCASION.

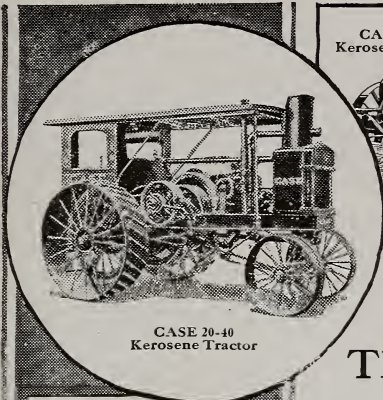
Our Corsage Bouquets are original and sure to please the Ladies

F. C. VIERECK
FLORAL SHOP

150 EAST STATE STREET

Bell, Main 6569

Citizens 9402



CASE 20-40
Kerosene Tractor



CASE 22-40
Kerosene Tractor

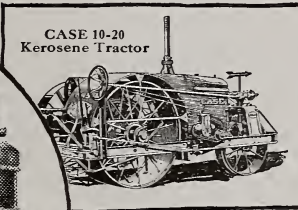


CASE 15-27
Kerosene Tractor



CASE 10-18
Kerosene Tractor

NOTE: We want the public to know that our plows and harrows are NOT the Case plows and harrows made by the J. I. Case Plow Works Co.



CASE 10-20
Kerosene Tractor



Look for the
EAGLE
Our Trade Mark

To avoid confusion, the J. I. CASE THRESHING MACHINE COMPANY desires to have it known that it is not now and never has been interested in, or in any way connected or affiliated with the J. I. Case Plow Works, or the Wallis Tractor Company, or the J. I. Case Plow Works Co.

The Case Line Offers Choice of Required Power and Capacity

KEROSENE TRACTORS

The Case 10-18 Tractor drives 20x28 Thresher with Windstacker, Feeder and Grain Handler; No. 12 Case Silo Filler with 40 ft. blower pipe; 17x22 Hay Baler; will pull 2-bottom plow, 6 to 8 inches deep, depending on soil and field conditions; 8 ft. double action Disc Harrow; 22 shoe Grain Drill; two 6 ft. Binders.

The Case 10-20 Tractor drives 22x36 Thresher and full equipment, pulls 3-bottom plow under favorable conditions; other machinery requiring similar power.

The Case 15-27 Tractor drives 26x46 Thresher with Feeder and Windstacker; three 14 in. plows in hard plowing, or four under favorable conditions; 10 ft. double-action Disc Harrow; two 7 ft. Binders, etc.

The Case 22-40 Tractor drives 32x54 Thresher with Windstacker, Feeder and Grain Handler; No. 20 Case Silo Filler with 40 ft. blower pipe; four 14 in. plows in hard ground or five under favorable conditions; battery of Grain Drills or Harrows.

The Case 20-40 Tractor will handle belt and drawbar jobs similar to 22-40.

The J. I. Case Threshing Machine Company also builds:

Double Disc Harrows for use with tractors
Grand Detour Plows, all sizes and for all soils and conditions

Threshing Machines,—six sizes
Hay Balers,—two sizes
Silo Fillers,—three sizes
Road Graders,—three sizes
Steam Tractors,—eight sizes
Rock Crushers,—two sizes
Steam Road Rollers,—two sizes

Booklets, describing and illustrating any products above mentioned, furnished on request.

J. I. CASE THRESHING MACHINE COMPANY, Inc.

Dept., CL-2 Racine, Wis., U. S. A.

Making Superior Farm Machinery Since 1842

Nitrate of Soda

IN CAR LOTS AT LOWEST
WHOLESALE PRICE

Likewise less than car lots for shipment at all times from Columbus, O. Also Nitrapo (15% nitrogen, 15% potash) and all domestic and foreign potash salts. Also manufacturers of

Arsenate of Lead Powder

Arsenate of Lead Paste

Calcium Arsenate

Bordo

Paris Green, Etc.

Write us for anything in fertilizer or spray line

Nitrate Agencies Co.

408-9 Central Nat'l Bank Bldg.
COLUMBUS, OHIO.

A MODEL DAIRY FARM

(Continued from page 212)

hogs if they wish. The extra labor usually gets 40c per hour.

A complete set of accounts are kept of all the main farm operations and especially the dairy records are quite complete. Mr. Smith says a man cannot operate a farm successfully unless he knows what is going on and the only correct way is by a complete set of accounts. He says it takes years of experience to be able to decide questions that may come up any day in a large business of this kind, and this point is never reached without costly mistakes, but experience is the best teacher.

AG SOCIETY ELECTS OFFICERS

Senior Chosen President of Townshend Club.

Officers for the next semester were elected at the meeting of the Townshend Agricultural Society Monday night.

The new officers are: president, John F. Dowler, senior; vice-president, Frank R. Bookmeyer, junior; secretary, E. B. Barker, junior; treasurer, Charles G. Clark, junior; censor, M. William Brady, senior; critic, La Verne McConnaughey, sophomore; musical director, Thomas C. Kennard, senior; pianist, George B. Ganyard, junior; sergeant-at-arms, Ray C. Spikler, sophomore; bill-poster, Eugene F. Townshend, sophomore. The executive committee is composed of Karl T. Woodward, senior; Vance Cleaver, junior, and Herbert L. Gartner, junior.

C. K. SEIBERT, President

I. D. SEIBERT, P. & Gen'l Mgr.

G. H. WOODROW, Sec'y & Treas.

The Fifth Avenue Floral Company

**Cut Flowers, Plants
and Corsages**

OFFICE AND GREENHOUSES

518-552 West Fifth Ave.

Citizens 16052.

Bell, North 278

STORE, 120 EAST BROAD ST.

Citizens 085.

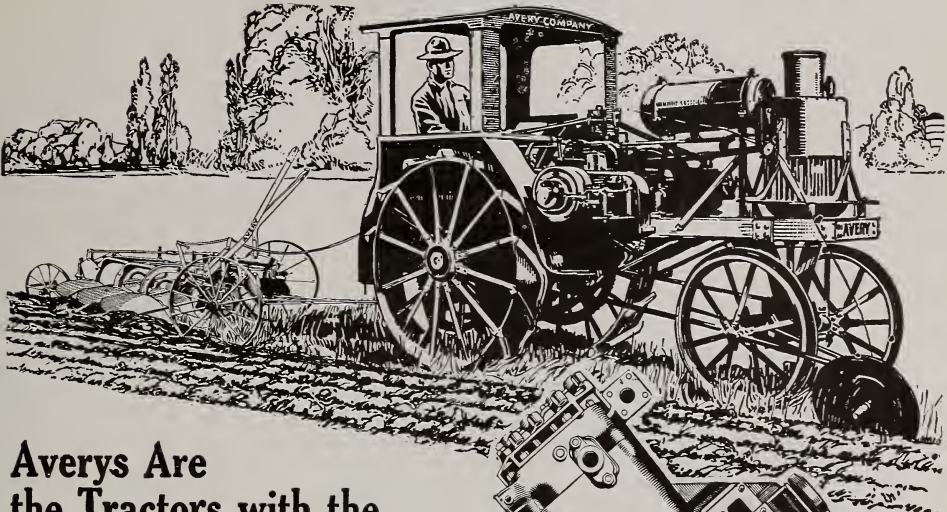
Bell, Main 2439

When You Are in Need of Our Lines, Remember
The Columbus Blank Book Mfg. Co.

313-21 SOUTH HIGH ST., Opposite Southern Hotel

High Grade General Office Stationers, Printers, Bookbinders, Legal Publishers

Phone Orders Delivered Promptly.



Averys Are the Tractors with the "Draft-Horse" Motor and "Direct-Drive" Transmission

WHEN you get an Avery you get a tractor with a motor especially built for tractor work, and exclusively for Avery Tractors. It is built like a draft-horse for the kind of work the tractor must do. *Powerful, heavy-duty, low-speed*—does not race under light loads or stall under heavy pulls.

It is a horizontal opposed motor improved and perfected with many exclusive Avery features. Its length distributes the weight properly between the front and rear wheels. Its narrow width makes possible a narrower tractor with less side draft. Also a short, heavy, practically unbreakable crankshaft—requires only two main bearings—always in perfect alignment—quickly adjustable with an ordinary socket wrench.

It is built with five-ring pistons, thermosiphon cooling system, valves-in-the-head, renewable inner cylinder walls, and gasifiers that turn the kerosene or distillate into gas and *burn it all*.

Because of its low speed the power of the Avery "Draft-Horse" Motor is delivered through

The Avery Patented Sliding Frame Transmission

giving "Direct-Drive" in high, low, reverse, or in the belt. The belt pulley is mounted right on the motor crankshaft. You get a larger percentage of the power developed by the Avery "Draft-Horse" Motor at the drawbar, and *all* the power in the belt.

These and other big features make Avery

Tractors run steady, economically and last a long time. These are some of the reasons why Avery owners are buying their second, third, fourth and even sixth Avery Tractors. They are easy to operate, even by the inexperienced. Avery prices are based upon the big output of three large Avery factories and the low selling cost of the complete Avery Line.

The Avery Line

includes tractors for every size farm—Six sizes, 8-16 to 40-80 H. P., with "Draft-Horse" Motors and "Direct-Drive" Transmissions. Two small tractors, Six-Cylinder Model "C" and 5-10 H. P. Model "B." One and two row Motor Cultivators, "Self-Lift" Moldboard and Disc Plows, Listers and Grain Drills, "Self-Adjusting" Tractor Disc Harrows. Also roller bearing Threshers, Silo Fillers, etc.

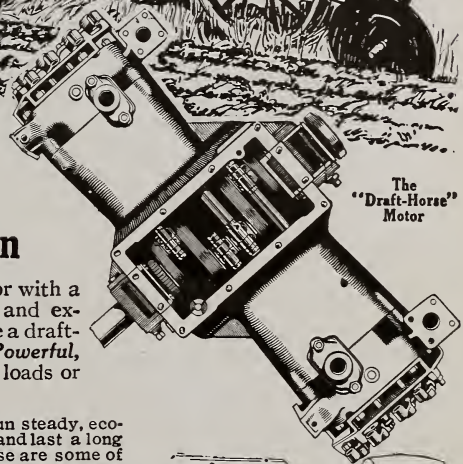
Write for the Avery Catalog and interesting Tractor "Hitch Book." Both books *free*.

AVERY COMPANY, 6403 Iowa St., Peoria, Ill.

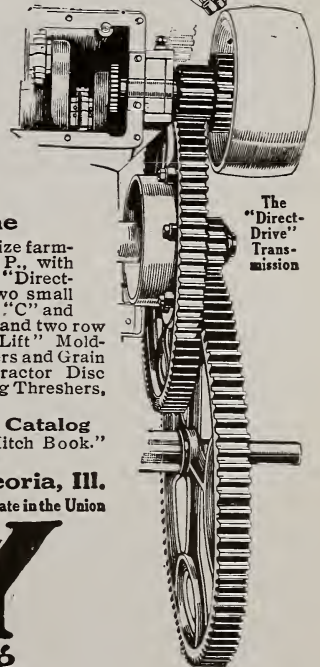
Branch Houses, Distributors and Service Stations Covering Every State in the Union

AVERY

Motor Farming, Threshing
and Road Building Machinery



The
"Draft-Horse"
Motor

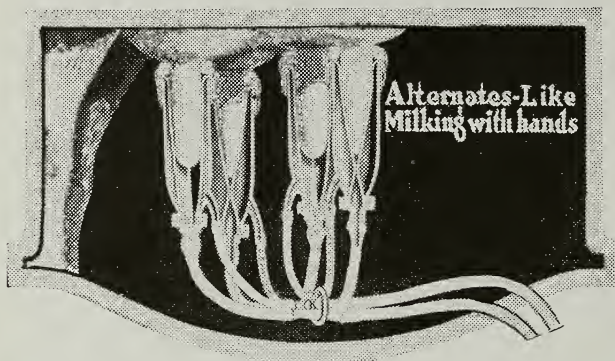


The
"Direct-Drive"
Transmission

Universal

natural milker

Alternates, Like Milking With Hands



Imagine a man with **two hands** on each arm and you have the idea of the alternate action — milking **two teats** at each stroke.

Easy to operate.

Easy to clean.

The most sanitary milker (maid) made.

Thousands giving perfect satisfaction.

Write for descriptive catalog

The Universal Milking Machine Company, Columbus, Ohio

'ROUND THE SOILS DEPT.

Arrangements have been made for a school for commercial fertilizer agents to be held here and at the Wooster Experiment Station during the week of June 7. This school will be under the auspices of the National Fertilizer Association, and instruction will be given by the soils staff of the college of agriculture and the Experiment Station. One hundred fertilizer salesmen will be in attendance. It is hoped that the sale of acid phosphate and high grade fertilizers will be increased at the expense of the sale of low grade, mixed fertilizer by giving the salesmen training in best fertilizer practices.

An article on Sampling Soil Plots has been submitted to Soils Science by Professor Bear, and will be published soon. It describes the results obtained in sampling the new fertility plots on the University farm. Seven hundred-

sixty separate analysis were made in an attempt to determine the best method of sampling.

S. F. Hinkle took a satisfactory examination for his masters degree, January 16. The subject of his thesis was Proposed Plan for Fertility Investigations on the University farm.

A fellowship at Ohio State University of \$1000 or \$1500 will be given by the National Fertilizer Association. This fellowship is to aid the chosen recipient in getting his advanced degree in soils work, and extends over three years.

Edward H. Bretschneider, '14, has a position with the Kauffman-Lattmer company of Columbus.

Thomas K. Prugh, '14, is running a hog farm at Dayton, Ohio.

Joseph M. Gohen, ex. '13, is truck farming in New Jersey.

Why Have Over 10,000,000 Hogs Been Treated With HOG-TONE?

WE have never claimed that Avalon Farms HOG-TONE is a universal "cure-all" or panacea.

But, for its intended purposes, HOG-TONE has shown such remarkable results in so many thousand instances that an ever-increasing number of hog raisers have tried it (at our risk) and have learned to rely on it.

We offer it to all on the same unconditional guarantee: Satisfactory results or your money back—and the user is the judge.

Write for a supply, stating the number of hogs you are feeding. No money in advance. You pay only if you are thoroughly satisfied that you got more fat from the same feed, and the HOG-TONE treatment has eliminated the minor diseases that hinder hog growth.

Always get HOG-TONE where possible from your local dealer. Or, if he is not stocked, write to us direct.

Avalon Farms Company

360 West Ohio Street

Chicago, Illinois

AVALON FARMS

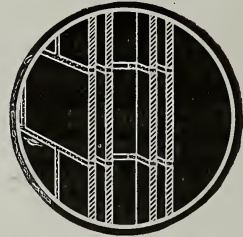
HOG-TONE



Please mention THE AGRICULTURAL STUDENT when writing advertisers.

Insures Cow Health

THE insulating blanket of still air in a Natco stable wall prevents sudden temperature changes. It protects the health of your cows and keeps up the milkflow in uncertain weather. Natco Hollow Tile walls do not gather moisture as do walls of solid masonry, nor do they absorb grease, dirt or foul odors.



Section of Natco wall showing still air spaces

Natco Barns

are a permanent *investment* — not an expense. They need no painting and very seldom require repairs. They withstand severest windstorms and are fire-safe, being constructed of burnt clay tile. Natco walls are exceedingly strong. Masons lay up these walls very rapidly, easily handling the large-size units.

Whatever you intend to build, build it with Natco Hollow Tile. Many uses are pictured and explained in our book, "Natco on the Farm." Write for it today — *free*.

National Fire Proofing Company

1210 Fulton Building Pittsburgh, Pa.

23 Factories assure a wide and economical distribution



Barn and Silos on farm of Geo. and Jos. D. F. Jankin, Easton, Md.

F-2

Burpee's Seeds Grow



BURPEE'S ANNUAL FOR 1920
The Leading American Seed Catalog

BURPEE'S ANNUAL

Burpee's Annual is a complete guide to the vegetable and flower garden. It fully describes Burpee Quality Seeds with a hundred of the finest vegetables and flowers illustrated in the colors of nature. If you are interested in gardening, **Burpee's Annual** will be mailed to you free. Write for your copy today.

W. ATLEE BURPEE CO.

Seed Growers

Philadelphia, Pa.

PREPARE NOW TO TEST SEED CORN

Obviously, the cornfield is an expensive seed tester, yet farmers persist in planting untested seed, with the result that they must replant or be satisfied with a poor stand, a consequent reduction in yield and a lower return. From his own viewpoint, no short job the farmer can do in the month of January, February or March, will be any more profitable than testing his seed corn.

Testing seed corn for germination is a very simple matter and can be carried out satisfactorily with the means at hand. No expensive equipment is required. Neither is the work difficult or tiresome—only carefulness is needed. And what does the farmer get in return?

If the fields are seeded with corn showing high germination, the best possible stand will be secured, other conditions being favorable. If a good stand is not obtained at the outset, the field cannot develop a capacity crop. It costs just as much to cultivate a poor stand as a full stand. Suppose a loss of twenty per cent in stand is due to planting inferior seed, which is not exorbitant. This would mean a loss of 1778 stalks to the acre, in the average corn field. If each of these stalks had existed to bear an eight-ounce ear, the additional corn product would have amounted to more than twelve bushels to the acre. Multiply this by the price of corn when the main crop was sold and one can readily see what the farmer lost through failure to plant good seed, or what it would have been worth to make the germination test.

Progress Laundry

**DRY CLEANING
PRESSING
and REPAIRING**

**The Place That Always Gives
You the Best for the Money.**

**Office: E. 11th AVE. & HIGH ST.
Bell, N. 2832 Columbus, Ohio**

BEST TIME TO BUY

AND SELL CATTLE

In a study of prices for cattle on the Chicago market for the 15 years from 1904 to 1918, inclusive, William L. Calvert, farm management demonstrator at University Farm, St. Paul, Minnesota, finds that the highest price for fat steers usually prevails from May to September and the lowest price for feeders and stockers in November, December and January.

"The best policy one year with another," he says, "would appear to be to buy the feeders in December, January or early February and have them ready for the May or June market. This would seem particularly desirable when silage forms a large part of the roughage. The silage does not deteriorate, while shock corn deteriorates rapidly in the later winter and early spring. If one has stalk fields or other feed that would go to waste, he would usually be ahead to buy his feeders in time to make use of this feed. Also the buyer who is on the market during the period when range cattle are being freely marketed may have opportunity to make better selection than the December and January or early February buyer. However, considerable advantage would be required to compensate for the longer feed."

Mr. Calvert feels that a farmer who bases his feeding and market practice upon a statistical study of market behavior in previous years will be a gainer in the long run, but calls attention to the fact that in a particular year markets may vary widely from the average trend.

Proof Positive!

In a twenty-year test to determine the value of various sources of Nitrogen, the New Jersey Experiment Station found "that crop yields and the percentage of Nitrogen recovered in the crop were greater when nitrates

Official figures are:
were used."

"If we assign to Nitrate Nitrogen a value of 100, then the relative availability of the four materials stands as follows:

Nitrate of Soda	100.0
Ammonium Sulphate	76.1
Dried Blood	62.0
Manure	52.4

The details of this important research were published in "Soil Science." Send for Copy.

**WM. S. MYERS
Chilean Nitrate Committee**

 **25 Madison Ave. New York**



The Feed that makes the Yield

Cut Down Your Cost

A NUMBER of the most successful dairymen testified before the Federal Milk Commission, which has been fixing the price of milk from the producer to the consumer, that they had cut down their costs of production by feeding **Corn Gluten Feed** and wheat bran freely in grain rations *they mixed themselves*.

The Commission must have been convinced by what these representative good dairymen had to say about different feeds and *the economy of a man's mixing up of his own rations*.

For, in arriving at the price it thought the dairyman ought to get for his milk, the Commission based its calculations on *home-mixed rations in which Corn Gluten Feed was a principal basic ingredient*.

Made by
Corn Products Refining Co.
New York Chicago

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

If you have not yet fed Buffalo Corn Gluten Feed, if you want to know more about how to feed it, and your dealer doesn't happen to have it, write us—giving his name.

SHRINKAGE OF CORN INFLUENCES ITS VALUE

How much do farm grains shrink when in storage, This question is frequently asked by farmers, particularly respecting corn, since the amount of shrinkage influences the weight of the bushel; this would, of course, influence the price for corn.

Tests at the Ohio Experiment Station show that well-matured corn has an average shrinkage of about 20 per cent, the amount ranging in an 8-year test from 6.5 to 27.7. Corn that has been stored when damp shrinks from 8 to 10 per cent more, it has been found.

If corn sold at \$1 a bushel in early fall well-matured corn will be worth \$1.05 on December 1. By March of the following year \$1.00 would be a fair price for the same bushel of corn. The increase after March 1 is gradual,

reaching a value of \$1.25 by June 1. In short, then, corn should be purchased at about 20 per cent less in the fall than on June 1 of the following year.

SPRING WHEAT UNCERTAIN FLY MAY INJURE CROP

That spring wheat is an uncertain crop for general culture in Ohio is pointed out by the Department of Agronomy at the Ohio Experiment Station. Their information is based upon cultural experiments, in which the average yield of spring wheat has been 18 bushels to the acre for six years,, while winter wheat with proper fertilization has averaged close to 34 bushels, over a period of 25 years.

Plenty of fertility and early seeding has been found to be necessary for spring wheat culture when it is carried

(Continued on page 247)

Choice Seed Corn

We can supply choice seed at a cost of about 70 cents per acre.

We have a number of varieties, including such popular sorts as **Reid's Yellow Dent, True Yellow Leaming, True Yellow Clarage, Livingston's Golden Surprise, Nellers Cattle, Johnson Co. White, Mammoth White Dent, etc.** Good, strong germination.

Now is the time to again supply your wants with your old, well-tested favorites. We feel that all varieties offered are very true to type.

Sample grains free on request. Mention varieties and quantities in which you are interested. Catalogue of 96 pages with "True Blue" descriptions tells when to plant and how. Free. Write for it.

Livingston Seed Company

COLUMBUS, OHIO

“He’s the Best Farm Hand We Ever Had”

Haven’t you often heard your father say that about one farm hand—that “old reliable” who is always on the job, doing more and better work than any of the others?

If your father knew that he could get all the farm hands he needed, each of them as good as that “best” one, he would grab at the chance, wouldn’t he?

When you begin operating your farm, after leaving school, you will hire fewer farm hands than your father does, but you will buy more farm machinery. You will have an opportunity that he didn’t have in hiring labor. You can be sure of reliability in all of your implements and machines.

The John Deere line is like a complete force of reliable farm hands. It is comprised of an implement for practically every farm operation. It has been a leader in quality for over three-quarters of a century. The success of the whole line is due to the high quality for each unit in the line.

Be sure to investigate the John Deere Full Line before you begin your career as a farmer. You will want the uniformly high quality that it insures.

JOHN DEERE, Moline, Illinois

The Daughters and Granddaughters of
Pietertje Hengerveld Sir Korndyke
Hold

Eight Places as Ohio Champions

We Have Young Bulls of This Breeding
For Sale Now.

Lothian Maggie DeKol 90209

Milk, Two Years, 52,058.1

Butter, 2258.07

WORLD'S RECORD

Novelty McKinley Hengerveld, 183356

Sr. 3—Eight Months After Calving

WORLD'S RECORD

THE LOTHIAN-RIVERODE STOCK FARMS

Novelty, Ohio

Holstein Friesian Cattle

ALEXANDER WATT
Novelty, Ohio

LEWIS M. WILLIAMS
Chagrin Falls, Ohio

SPRING WHEAT UNCERTAIN

(Continued from page. 244)

on in Ohio. Some of the land in northwestern Ohio has been found to be adapted to spring wheat but not all soils in Ohio in general.

The heavy infestation of Hessian fly throughout the State also puts spring wheat in the more doubtful list of farm crops, because the spring brood of the fly always attacks the newly-sown spring wheat, since it is much more tender than the growth of winter wheat. The infestation of fly is so heavy that entomologists at the Ohio Experiment Station do not advise sowing spring wheat during the coming season.

SPRING BULLETINS ARE NOW READY FOR FARMERS

Spring bulletins available to farmers of Ohio free upon request to the Ohio

Experiment Station, Wooster, include "Potato Diseases of Ohio," "Apple Blotch, a Serious Fruit Disease," "The Maintenance of Soil Fertility," "Soybeans, Their Culture and Use," "Dependable Fruits" and "Tomato Diseases in Ohio."

Other information is available through the Monthly Bulletins of the Station on "Orchard Fertilizing Experiments," "Choosing Gooseberry Varieties," Commercial Grape Growing," "Pruning Apple Trees," "Grafting and Budding Fruit Trees," and "Simple Methods of Celery Culture."

A spray calendar, giving the kinds of spray necessary for practically all kinds of fruit and vegetables diseases and insects may be secured also upon request.

Constant Improvement

The advent of the separator, milking machine, gasoline engine, and other labor saving devices has not only revolutionized dairy methods, but has also stimulated investigation of cleaning problems in the dairy.

This investigation has demonstrated the failure of soaps and cleaners with grease or caustic content to provide the sanitary cleanliness necessary to the production of highest quality milk products.

Today thousands of the most successful creameries and dairies are using



Wyandotte
Dairyman's
Cleaner and Cleanser

because not only does it produce a sanitary cleanliness that protects the milk quality, but its efficient cleaning properties also minimize cleaning costs.

Should not your business judgment prevail on you to profit by the experience of others and standardize this cleaner in your establishment? Order from your regular supply house. It cleans clean.

The J. B. Ford Co., Sole Mnfrs.,

Wyandotte, Mich.

Pedigree only has never made any sire permanently great.

**But Countless Are the Sires That
Have Made Themselves Great.**

The sire that appeals to us is the one that builds his reputation upon the performance of his daughters and does not have to rely upon the reputation of his ancestors. Finderne Pride Fayne has proven himself through the work of his daughters, one of them making over 37 lbs. and another becoming leader of her state for milk production in her class.

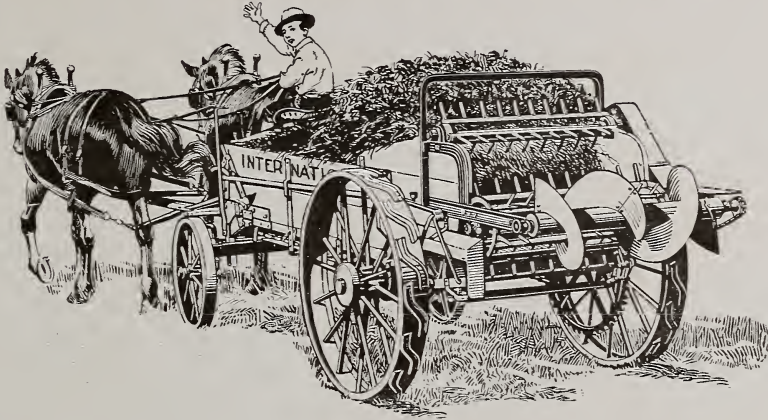
You can buy a son of FINDERNE PRIDE FAYNE with a full knowledge that he is **making himself great.**

Meadow-Holm Farm

PETER SMALL
Chesterland, O.

H. B. GOODING
Tiffin, O.

The New International Challenges your Criticism!



Anything missing in this List?

1. **Roller Bearings**—Roller bearings at seven points—the only spreader so equipped.
2. **Double Ratchet Drive**—Walking beam transmission from main axle eccentric and extra large ratchet wheel give easy, strong, steady feed. Box tapered to eliminate friction on box side. Six feed speeds.
3. **Oscillating Front Axle**—Auto-type, permitting short turn. No pole whipping.
4. **Power; Both Wheels**—Power is transmitted from both ends of the rear axle—beaters and wide-spread driven from one wheel and the manure feed from the other.
5. **Wheels Track**—Rear wheels track with the front wheels, lightening draft.
6. **Tight Bottom**—There is no clogging, jamming apron, because the spreader has a tight bottom. Spreads anything.
7. **Two Beaters**—Two all-steel beaters with chisel-pointed square teeth work from both top and bottom of the load.
8. **Wide-Spread**—The spiral behind the beaters gives the manure a third beating, and spreads it finely and uniformly beyond the wheels.
9. **All-Steel Main Frame**—Wood box sides hold only the load.

For complete descriptive information address

INTERNATIONAL HARVESTER COMPANY

CHICAGO

OF AMERICA INC.

U S A

WHEN YOU PRUNE TREES REMEMBER THESE POINTS

In response to many inquiries as to advice in pruning fruit trees, the Ohio Experiment Station names a number of points to be kept in mind in pruning operations. They are:

1. To properly form the tops and keep them well balanced.
2. To let the requisite amount of sunlight into all parts of the tree tops.
3. To remove branches which are in poor condition and to prevent serious damage by crowding of branches.
4. To make picking easier and spraying more effective.
5. To thin the fruit.
6. To lower and to renew the tops of trees.

In young orchards it is necessary to train the apple trees so that they will grow into proper shape, while with older orchards, to prune with the idea to encourage fruit production.

A saw with a narrow blade about 16 inches long, a hand shearer, and a heavy pocket knife are practically the only tools required for pruning.

SPRAYING CONTROLS SAN JOSE SCALE PEST

That the San Jose scale, which at one time threatened to destroy the orchard industry, needs to be watched, and special attention given to spraying to control the pest.

Tests conducted in spraying by the Ohio Station show that scale develops plentifully on unsprayed trees set aside as checks in orchards where tests of insecticides are being made.

Practically all commercial orchardists use a dormant spray consisting of lime sulphur or miscible oils as protection against scale.

For Cheese Factories and Creameries HANSEN'S DANISH Dairy Preparations Pure, Concentrated, Ready To Use.

For uniformly best results in making finest cheese, butter and buttermilk. America's standards backed by years of specialized experience, used in the country's finest creameries and cheese factories.

Hansen's Danish Rennet Extract

Hansen's Danish Cheese Color

Hansen's Danish Butter Color

Bulk, 1 gal. or larger.

To properly ripen the cream for butter, and the milk for cheese and commercial buttermilk, use Hansen's Lactic Ferment Culture.

For sale at all dairy supply stores.

Chr. Hansen's Laboratory, Inc.
Little Falls, N. Y. Milwaukee, Wis.
Toronto, Can.

Interesting treatise, "The Story of Cheese," by J. D. Fredericksen, free on request.

Bell No. 1746

Citz. 16754

BROSMER'S

1591 NORTH HIGH

*Home of those Creamy,
Chocolate Butter Creams
and Bitter Sweets*



**Our Chocolates and Bon Bons
Are Made Fresh Daily.**



**We Also Carry a Full Line of
Salted Nut-Meats, Ice Creams
and Baked Goods**



Purina Pig Chow Keeps 'em Coming

Before they are born
and after they are born
Pig Chow

nourishes the whole pig

Bone-building phosphates and flesh-making protein are supplied by alfalfa and tankage.

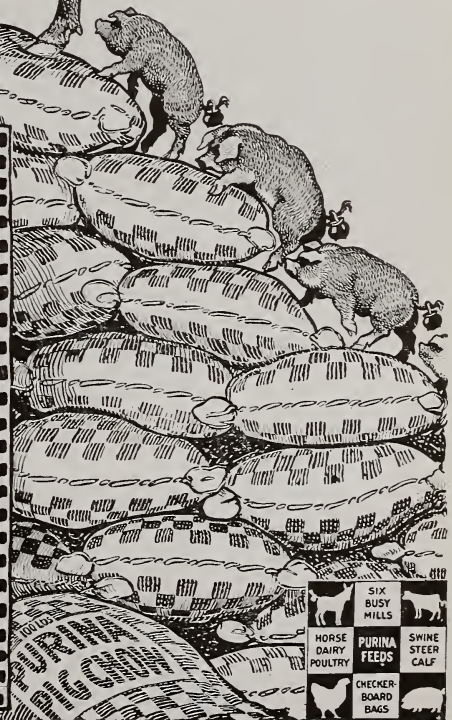
After weaning, Pig Chow brings the pigs right on up. The cane molasses and other fattening ingredients fatten the pigs as they grow. Purina-fed pigs frequently make

**250 to 285 lb. hogs at
the age of six months.**

Give Pig Chow a trial. If your dealer can't supply you, write us.

PURINA MILLS

St. Louis, Mo. Nashville, Tenn.
Ft. Worth, Tex. Brooklyn, N.Y.



HARDWOOD TREE BEST FOR LAWN PLANTING

Well selected hardwood trees, such as oaks and elms, should be among the first choice in the selection of trees for lawn planting. When thoroughly established they will grow to maturity almost as quickly as any other species.

It has been found that nursery-grown stock of a permanent species give better satisfaction than trees taken from forest areas and planted in lawns, as the nursery stock has been accustomed to sunlight on all sides and growth is checked but little when moved into permanent quarters.

The cucumber tree is a species of magnolia that develops into a stately tree for a park or roomy lawn.

The foliage of magnolia macrophylla is exceptionally large, but the tree should be planted in a sheltered place in

order to protect the leaves from wind injury.

White ash, American linden or basswood and American beech also have good landscape values.

The soft or silver maple is quite popular for lawn planting, but it cannot be considered as a permanent tree because it is easily damaged by high wind and in old age the tree often has a dilapidated appearance. A much more permanent tree is the sugar maple.

Among the purely ornamental trees the flowering dogwood, service, judas tree, small magnolias, birches, native hawthorne and Chinese flowering crabs are attractive and easily handled.

F. N. Morrison, '16, is now connected with the rural economic department at O. S. U. He is helping in the organization of cost account circles in different counties.

FOR GOOD THINGS TO EAT

—GO TO—

MARZETTI'S RESTAURANTS

Where Only the Best is Served

TENTH AVE. AND HIGH ST.
Seating capacity of Table service 300
Separate Ladies' Dining Room

59 EAST GAY STREET
Seating capacity of
Table Service 125

CHICKEN, STEAKS, CHOPS, TURKEY, RABBIT, LOBSTER
AND SEA FOOD,
SPAGHETTI, RAVIOLI, POLPETTE, ETC.

Special Dinners Lunches Plate Dinners

SIX TESTS FOR A FARM POWER-PLANT

There are many tractors, but
the *Moline Tractor is Universal*

It is **THE ONLY** **FARM POWER-PLANT**

Combining



Exclusive Features

with

Indispensable Results

- | | | | |
|--|---|--------------|----------------------------|
| 1. Does all field work, including cultivating, harvesting and belt work | } | <i>Means</i> | No duplication by horses |
| 2. One man completely operates both tractor and all implements | | | |
| 3. A single seat in the center of all controls of tractor and implement | } | <i>Means</i> | Great ease of operation |
| 4. A single unit of operation—the tractor and implements form but one unit | | | |
| 5. Operator sees all his work—"Foresight is better than hind sight" | } | <i>Means</i> | Better and faster work |
| 6. Tractive power in front of the work with operator behind the work | | | |
| | | <i>Means</i> | Power like horses are used |

UTILITY IS NOT SACRIFICED FOR PRICE

The Power of a Correct Principle

The principle of doing all field operations with one man sitting where he can watch his work is correct, or farming has always been done backward, and the operator would always have ridden or led his horses instead of driving them.



The Moline Universal Tractor places the power of nine big horses where the horses stood—is driven just like horses are driven, from the seat of the implement, and hitched up to the implements just like horses are hitched.



NOTE—If desired you can use the "drag behind" or horse drawn implements you now have with the Moline Universal the same as with other types of tractors

See your Moline Dealer or write our nearest branch for full information.

Moline Plow Company, Moline, Illinois

Branches at:

Atlanta
New Orleans
Dallas

Oklahoma City
St. Louis
Poughkeepsie, N. Y.

Baltimore
Los Angeles
Stockton, Cal.

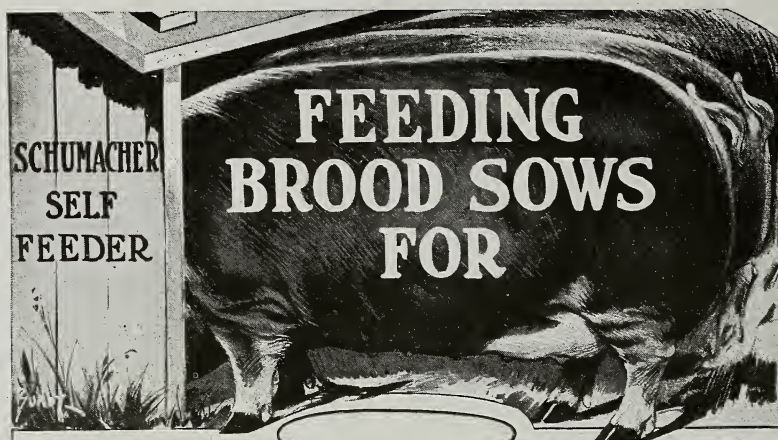
Spokane
Portland
Salt Lake City

Denver
Kansas City
Omaha

Minneapolis
Minot, N. D.
Sioux Falls, S. D.

Des Moines
Bloomington, Ill.
Indianapolis

Columbus, Ohio
Jackson, Mich.



Bigger, Stronger Litters and Bigger, Faster Growing Shoats

The care and feed given the sow from the time she is bred until she farrows and then, both sow and litter until weaning time, has much to do with the profits you make from your hogs. If your sows are fed and handled right, bigger, stronger litters are sure to come. The pigs will thrive better, grow vigorously right up to weaning time. Then, if given the proper growing feed, pasture and exercise, bigger frames, heavier bone and better finish, with bigger profits, will result.

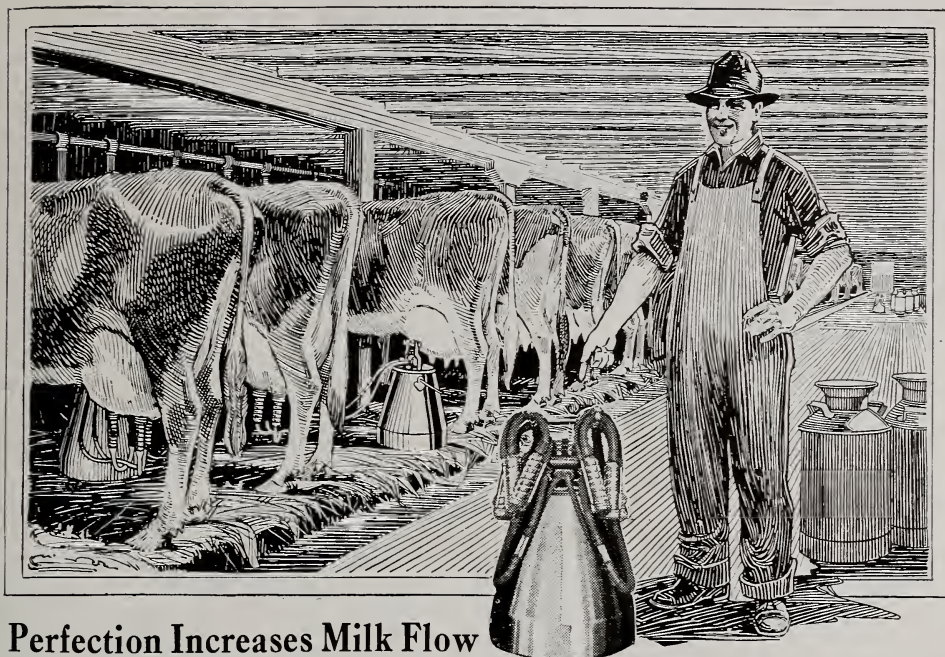
SCHUMACHER FEED

and the SCHUMACHER SELF-FEEDING PLAN have proven to thousands of hog men and farmers to be an ideal way of raising hogs. First, SCHUMACHER FEED, fed in self-feeders with tankage, puts brood sows in ideal farrowing condition. Second, it gives the little pigs the right start through the mother. Third, after weaning it develops bigger bone and frames, and with the addition of corn and tankage it will put on fat quicker and cheaper than anything you ever used.

Don't feed ear corn in a snow covered feed lot—it is too expensive—too much feed is wasted. The self-feeder with compartments for corn, tankage and Schumacher affords a much cheaper and better way.

The Quaker Oaks Company Address Chicago, U.S.A.





Perfection Increases Milk Flow

WHEN asked what feature in the Perfection Milker he considered most valuable Mr. Charles M. Yarter, who is a well known dairyman in his State, said recently: "With the use of the Perfection we milk and strip fifty-four cows in eighty minutes, and yet I consider the greatest profit derived from using the Perfection is not so much in the time it saves as in the increased milk flow. We surely get much more milk with the machine than we could if we depended on hired help to do all the milking by hand, and we are getting a much better quality of milk too."

The Most Profitable Machine on the Farm

"I have gotten more benefit for each dollar put into my Perfection than from any other machine on my farm. We use the machine twice daily, Summer and Winter, while we only use any of our other machines a few weeks during the year. *The milker helps to make all our other machinery more valuable by giving us longer days to use it.*

"I believe the Perfection Milking Machine is the simplest, easiest to keep clean, less liable to get out of order and draws the milk more naturally and with more comfort to the cows than any other milking machine or hand milker I know of."

Send For Names, Addresses and Catalog

Mr. Yarter is only one of thousands of satisfied Perfection owners. What the Perfection has done on his farm, it will do on yours. Write us and we'll gladly send you names and addresses of owners to whom you can write yourself. We'll also send a free copy of "What a Dairyman Wants to Know" the great book which answers every question about milking machines. Write today.

Perfection Manufacturing Company

2143 E. Hennepin Avenue

Minneapolis, Minn.

The Perfection is the Milker with the Downward Squeeze Like the Calf.

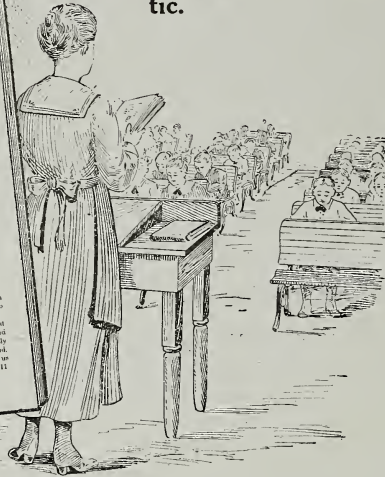
PERFECTION MILKER

Why did you go to Columbus?

Was It Because of a Desire for Higher Education
Created by Your District School?



Boys and Girls Need
More Than Readin',
Ritin' and 'Rithme-
tic.



An Aid to Teachers of Agriculture

The Rural Schools Bulletin, published monthly by Successful Farming, and sent free to teachers in the Central States, contains lessons on agriculture for primary, intermediate, and advanced grades. These lessons help to inspire the pupils with the possibilities of profit and pleasure in farm life. They teach the youngsters new and practical things about crops and soils, livestock raising, and farm home making. They create and intensify a desire on the part of the pupils to get the very best agricultural education possible.

Teachers are enthusiastic about the bulletins because they find them of real help in teaching agriculture. Pupils in schools where these bulletins are used, take a lively interest in the study of agriculture, and a greater interest in all other school work. We shall be glad to send it to any college student who asks for it.

This is but one of many special services provided by Successful Farming for the benefit of its readers, and for the cause of better agriculture. Agricultural students, farmers, and all others interested in agriculture, will find Successful Farming a worthwhile addition to their reading tables. The subscription rate is reasonable—\$1 for three years. Sample copy on request. Write us today while you have the matter in mind.

SUCCESSFUL FARMER

THE FARMERS' SERVICE STATION

103 SUCCESS BLDG.

DES MOINES, IOWA



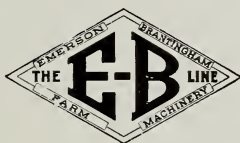
The E-B Model AA 12-20 Tractor

(S. A. E. RATING)

Easy to Handle--Light-weight--Economical to Operate

IT'S IN THE "AG" ENGINEERING BUILDING

Look It Over Carefully



EMERSON BRANTINGHAM IMPLEMENT COMPANY
(Incorporated)

ESTABLISHED 1852 ROCKFORD, ILLINOIS

**A Complete Line of Farm Machinery Manufactured
And Guaranteed by One Company.**

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

DE LAVAL

the world's cream saver



Thousands of De Laval Separators have been sold to young people just beginning to run a farm, because a father or friend wanted to see them start right.

The older people know from experience that the De Laval skims cleaner, runs easier and lasts longer. They also remember the service they have always received from the De Laval Company and its agents.

The superiority of the De Laval and the uninterrupted service back of it are responsible for the fact that there are more De Laval's in use than of all other makes combined.

Any time is a good time to buy a De Laval Cream Separator—to start saving cream, as well as time and energy.

If you want to "start right," see nearest De Laval agent.
If you do not know his name, write to nearest De Laval office.

THE DE LAVAL SEPARATOR CO.

165 Broadway
NEW YORK

29 East Madison Street
CHICAGO

61 Beale Street
SAN FRANCISCO